SONY®
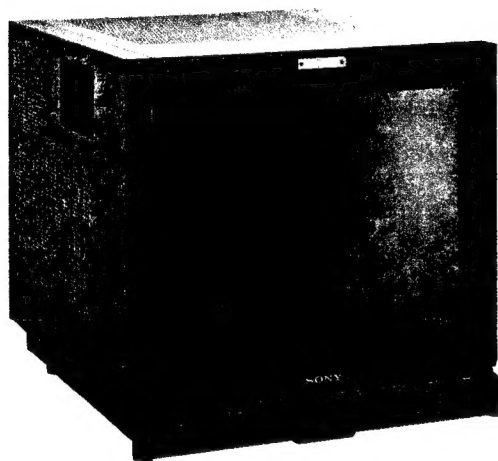
TRINITRON® COLOR VIDEO MONITOR
BVM-1911
BVM-2011P

BVM-1911
Chassis No. SCC-A97C-A
BVM-2011P
Chassis No. SCC-B26C-A

‖·‖ iꞮ‖ TRINITRON

OPERATION AND MAINTENANCE MANUAL
1st Edition
Serial No. 2000001 and Higher (BVM-1911)
Serial No. 2000001 and Higher (BVM-2011P)

WARNING

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

For the customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der Farb-Videomonitor BVM-2011P in Übereinstimmung mit den Bestimmungen der BMPT-Amtsblatt Vfg 243/1991, 46/1992 funkentstört ist. Der vorschriftsmäßige Betrieb mancher Geräte (z.B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienungsanleitung. Dem Bundesamt für Zulassungen in der Telekommunikation wurde das inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Sony Deutschland GmbH
Hugo Eckener Str 20
50829 Köln

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

VORSICHT!!

Hinweis für den Benutzer
Das Gerät ist nicht für den Einsatz in Bild-schirmarbeitsplätzen vorgesehen.

CAUTION!!

**DO NOT USE THE EXTERNAL DEGAUSSER TO DEMAGNETIZE THE SCREEN.
BE SURE TO USE THE DEGAUSS SWITCH ON THE FRONT PANEL.**

ATTENTION AU COMPOSANT AYANT RAPPORT A LA SÉCURITÉ!!

LES COMPOSNATS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÉCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÉCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DU CIRCUIT QUI SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT SONT INDETIFIÉS DANS CE MANUEL. SUIVRE LES PROCÉDURES QUAND LES COMPOSANTS CRITIQUES SONT REMPLACÉS OU LE FONCTIONNEMENT IMPROPRE EST SUSPECTÉ.

ATTENTION!!

**NE PAS UTILISER DE DÉMAGNÉTISEUR EXTÉRITUR POUR DÉMAGNÉTISER L'ÉCRAN.
UTILISER LA TOUCH DE DÉMAGNÉTISATION (DEGAUSS) SUR LE PANNEAU FRONTAL.**

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Section 1 Operation

1-1. Overview

1-1-1. Features

The BVM-1911 and BVM-2011P are high-performance color video monitors designed for critical evaluation of video signals in broadcasting stations and production houses.
The BVM-1911 is the NTSC model intended for use in NTSC color standard areas and the BVM-2011P is the PAL model for the PAL color standard areas. By using optional plug-in type decoder boards, both models permit any of the NTSC, PAL, SECAM, D1 and D2 video signals to be monitored.
The other features and operations are the same.

High-resolution picture
The Super Fine Pitch Trinitron picture tube (0.3-mm aperture grille pitch) gives a high resolution, high contrast picture. Horizontal resolution is more than 900 TV lines at the center of the picture.

Stabilized color temperature
The incorporated beam control circuit maintains the color temperature constant for a long period of time.

Picture aspect selection
In addition to the conventional 4:3 aspect, the 16:9 aspect can be selected for monitoring the increasing number of wide-screen programs.

Split screen for precise picture confirmation
The lower half of the picture can be displayed in monochrome mode while the upper half is displayed in color mode. This facilitates confirmation of the luminance and chrominance channels, evaluation of the noise in the chrominance or luminance channel, etc.

Blue-only mode for precise evaluation of noise components
In blue-only mode, an apparent monochrome display is obtained with all three control grids driven with a blue signal. This facilitates color saturation and phase adjustments and observation of VTR noise.

Easy and precise convergence adjustment
The convergence can be adjusted at 15 points (for 4:3-aspect pictures) of the screen. This system facilitates adjustment of the peripheral areas of the screen.

Section 1 Operation

Easy-to-use menu operations
The essential parameters to be preset for video monitoring can be easily set by selecting menu options displayed on the screen.

Other features
- Picture setup function facilitating adjustment of the monitor's reference black for the black level of an incoming video signal
- Pulse cross function for simultaneous checking of the horizontal and vertical sync signals or VITS (Vertical Interval Test Signal)
- Built-in crosshatch and 100% white signal generators, facilitating monitor setup
- VITC (Vertical Interval Time Code) display possible using the optional BKM-1460 VITC adaptor
- Auto chroma/phase adjustment, automatic white balance adjustment etc. are possible using the optional BKM-2056 auto set-up adaptor.
- Precise setting of black level of the monitor, using the optional BKM-1480 black level signal generator
- A drawer containing convergence, white balance and menu controls and other function selectors
- High-performance comb filter available for the BVM-1911as built-in standard. (For the BVM-2011P, the BKM-1422 is available as an opton.)
- Auto and manual degaussing
- Three-position AFC switch
- Overdrive protection circuit to protect against picture tube damage
- EIA standard 19-inch rack mounting, using the optional BKM-2000 rack mount kit

1-1-2. Options

The following optional accessories are available for flexible changes and enhancement of the functions of the BVM-1911/2011P.

Caution
When installing the optional boards, be sure to perform the necessary settings by following the procedure mentioned in "To specify the installed optional boards" of "1-4-7. Defining the Monitor Configuration." If the settings are not correctly performed, the optional boards may not function properly.

BKM-1410 NTSC adaptor (BC board) [built-in standard for the BVM-1911] .
Decoder board for the NTSC color system

BKM-1411 NTSC comb adaptor (BB board)
Comb filter board for the NTSC color system

BKM-1412 NTSC comb adaptor (BT board) [built-in standard for the BVM-1911]
Dynamic comb filter board for the NTSC color system

BKM-1420 PAL adaptor (BD board) [built-in standard for the BVM-2011P]
Decoder board for the PAL color system

BKM-1421 PAL-M adaptor (BM board)
Decoder board for the PAL-M color system

BKM-1422 PAL comb adaptor (BT board)
Comb filter board for the PAL color system

BKM-1430 SECAM adaptor (BE board)
Decoder board for the SECAM color system

BKM-1440 RGB/component adaptor (BF board)
Decoder outputs of RGB or component signals

BKM-1460 VITC adaptor (BL board)
Reader of Vertical Interval Time Code

BKM-1470 safe area display (BQ board)
For displaying the safe area

BKM-1480 black level signal generator (BS board)
For generating black level signals

BKM-2000 rack mount kit
For mounting in an EIA standard 19-inch rack

BKM-2053 auto set-up probe
For auto set-up operation with the BKM-2056 auto set-up adaptor

BKM-2056 auto set-up adaptor (BN, BO and BP boards)
For auto chroma/phase adjustment, auto white balance adjustment, and selection of color temperature

BKM-2085-20 digital 4:2:2 serial input kit (BA3 and BV boards)
For two serial inputs of component digital video signals

BKM-2090-20 D-2 serial input kit (BA3 and BU boards)
For serial input of a digital composite video signal

Section 1 Operation

Combination of the optional boards

The BVM-1911/2011P is equipped with the board compartments B1 through B5 behind the right-side panel, each of which can hold an optional board selected from the B boards listed above.

Board compartments
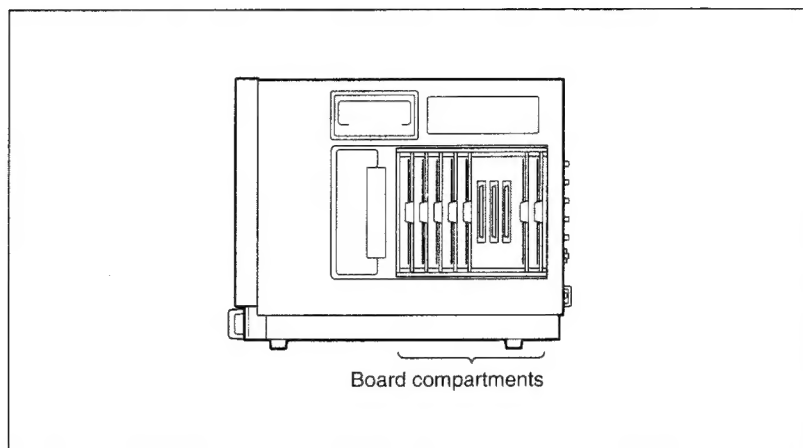
Right-side view

The BVM-1911 comes from the factory with the BT (NTSC comb adaptor) and BC (NTSC adaptor) boards installed in compartments B4 and B5.
The BVM-2011P comes from the factory with the BD (PAL adaptor) boards installed in compartment B5.
Note that the combinations of boards are limited by the allowable board assignments, as shown in the table on the next page.
Add the desired boards or replace the supplied BT, BC or BD board with optional boards, referring to the table on the next page.

Notes
- The compartments other than B1 through B5 are reserved for the supplied BA, BG, BH, BI and BJ boards. Be sure to use these boards in the respective compartments having the same names.
- Do not leave compartment B5 empty. Be sure to insert one of the boards specified in the table on the next page. If no board is inserted, the luminance/chrominance or luminance channel will not be activated in composite signal mode.

Board assignment

Board name	Function	Compartment name				
		B5	B4	B3	B2	B1
BB (BKM-1411)	NTSC comb filter	X	○	○	○	○
BT (BKM-1412)	NTSC comb filter	○	○	○	○	○
BT (BKM-1422)	PAL comb filter	○	○	○	○	○
BC (BKM-1410)	NTSC decoder	○	○	○	○	○
BD (BKM-1420)	PAL decoder	○	○	○	○	○
BE (BKM-1430)	SECAM decoder	○	○	○	○	○
BM (BKM-1421)	PAL-M decoder	○	○	○	○	○
BF (BKM-1440)	RGB/component adaptor	X	X	○	X	X
BL (BKM-1460)	VITC reader	X	X	X	○	X
BQ (BKM-1470)	Safe area display	X	△	X	○	X
BS (BKM-1480)	Black level signal generator	○	○	○	○	○
BN, BO, BP (BKM-2056)	Auto set-up adaptor	○	○	X	X	X
BV, BA3 (BKM-2085-20)	Digital 4:2:2 serial interface	X	X	X	X	○
BU, BA3 (BKM-2090-20)	D-2 serial interface	X	X	X	X	○

○ : acceptable
× : not acceptable
△ : acceptable but the switch or control settings on the subcontrol panels cannot control the display.

Notes
- Do not use the BD (PAL decoder) and the BM (PAL-M decoder) boards simultaneously. This causes malfunctions of the monitor.
- Do not use the BB (NTSC comb filter) and the BT (NTSC comb filter) boards simultaneously. This causes malfunctions of the monitor.

For details on installation and functions of the optional boards, refer to the operation and maintenance manuals of the boards.

Section 1 Operation

1-2. Voltage Selection

The BVM-1911 operates on 100-120 V AC and the BVM-2011P
operates on 220-240 V AC.
Before connecting the unit to an AC outlet, make sure the voltage
selector at the rear of your monitor is set for the appropriate voltage.
If not, change the position of the selector.

Voltage selector
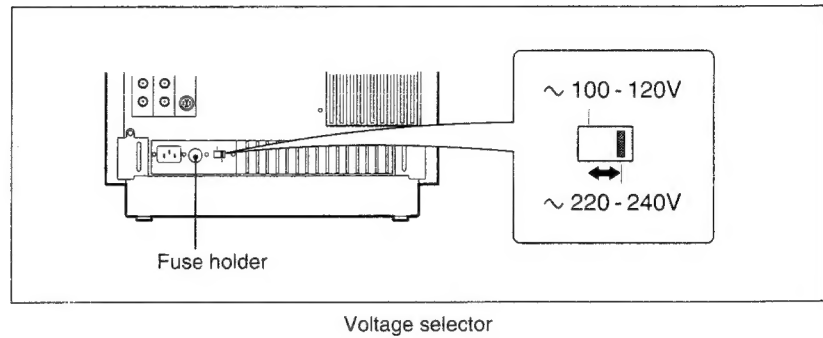
Note

Use a 4A/125 V fuse for the BVM-1911 (100-120 VAC) and a T2A/
250V fuse for the BVM-2011P (220-240 V AC). The appropriate fuse
is installed at the factory in accordance with the voltage presetting.

1-3. Location and Function of Parts

1-3-1. Front Panel

1 Tally lamp

2 AUTO SETUP PROBE connector

3 DEGAUSS switch

4 SCAN MODE switches

5 SCREEN switches

6 APERTURE switch

7 BLUE ONLY switch

8 MONO MODE switch

Drawer keyhole

9 PHASE MANUAL switch and control

10 CHROMA MANUAL switch and control

11 BRIGHTNESS MANUAL switch and control

12 CONTRAST MANUAL switch and control

13 OVERLOAD lamp

14 MANUAL lamp

15 INPUT selectors 1-4

16 POWER switch and lamp

The photo shows the BVM-1911. The parts configuration is common to the BVM-2011P.

Front panel

❶ Tally lamp

Lights when pin No. 3 and No. 8 of the REMOTE connector on the rear panel are short-circuited. The model number plate has been attached here at the factory. Replace it with one of the supplied tally number plates, as illustrated below.

Plate (white)

Number plate

Screws
Cover plate
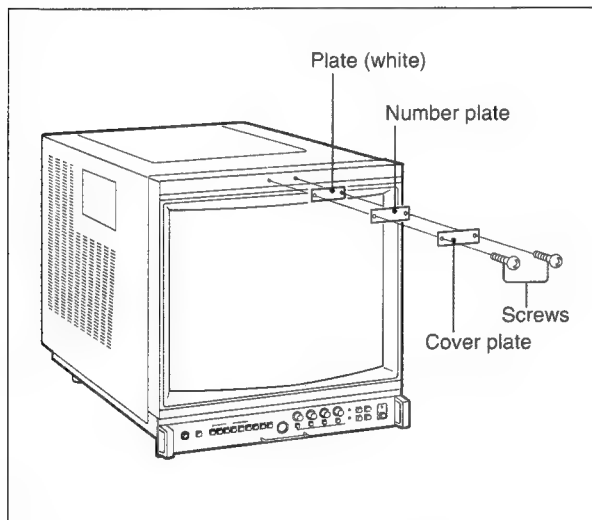
❷ AUTO SETUP PROBE connector

Connect the optional BKM-2053 auto set-up probe for auto setup operations.

❸ DEGAUSS switch

When the power is turned on, automatic degaussing is activated.
To demagnetize the screen manually, press this switch momentarily with the power on.
When degaussing repeatedly, wait for 5 minutes or more before pressing the switch again.

❹ SCAN MODE switches

▢ **(underscan):** Depress this switch for underscanning. The display size is reduced by approximately 3% so that four corners of the raster are visible.

▐ **(horizontal delay):** Depress this switch to observe the horizontal sync signal in the left quarter of the screen. Picture brightness is automatically increased for easy observation.

▬ **(vertical delay):** Depress this switch to observe the vertical sync signal. The picture is shifted vertically and the vertical sync signal is displayed near the center of the screen. Picture brightness is automatically increased for easy observation.

• A pulse cross is displayed by depressing both the ▐ and ▬ switches.
• To resume normal scanning, press to release the depressed switches.

❺ SCREEN switches

The R, G and B switches turn the red, green and blue beams respectively on and off. To turn off the beam, depress the switch. To turn it on again, press to release it.

❻ APERTURE switch

Normally keep this switch released. A flat frequency response is obtained.
For aperture correction, depress this switch and adjust the APERTURE control inside the drawer. The boost frequency, 4.5 MHz or 6.5 MHz, can be selected with the S1 switch on the internal BG board.
With the S1 switch set at the 4.5 MHz position, the frequency response can be adjusted continuously with up to 6 dB boost at 4.5 MHz for subjective enhancement of the displayed picture.
With the S1 switch set to the 6.5 MHz position, the frequency response can be adjusted continuously with up to 6 dB boost at 6.5 MHz for compensation of aperture loss of the CRT.

❼ BLUE ONLY switch

Normally keep this switch released. Depress this switch to turn off the red and green signals. A blue signal is displayed as an apparent monochrome picture on the screen. This facilitates CHROMA and PHASE control adjustments and observation of VTR noise.

❽ MONO MODE switch

Normally keep this switch released (AUTO mode).
Color or monochrome mode is automatically
selected according to the presence or absence of
color burst.
Depress the switch to display color pictures in
monochrome (MONO mode).

❾ PHASE MANUAL switch and control

When this switch is in the released position, the
subcarrier phase preset with the PRESETS menu
operation is obtained.
To adjust the subcarrier phase manually, depress
the switch and turn the control.
See "1-4-3. Presetting the Picture Levels."

Note

The PHASE MANUAL switch and control are
disabled when the SECAM system is selected (the
SECAM lamp is lit) with the SYSTEM button in
the drawer, or the PAL system is selected (PAL
lamp is lit) with selecting PAL D mode (the PAL
S/SECAM F/COMB S lamp is not lit).

❿ CHROMA MANUAL switch and control

When this switch is in the released position, the
color saturation preset with the PRESETS menu
operation is obtained.
To adjust the color saturation manually, depress
the switch and turn the control.
See "1-4-3. Presetting the Picture Levels."

⓫ BRIGHTNESS MANUAL switch and
control

When this switch is in the released position, the
brightness preset with the PRESETS menu
operation is obtained.
To adjust the brightness manually, depress the
switch and turn the control.
See "1-4-3. Presetting the Picture Levels."

⓬ CONTRAST MANUAL switch and control

When this switch is in the released position, the
contrast preset with the PRESETS menu operation
is obtained.
To adjust the contrast manually, depress the switch
and turn the control.
See "1-4-3. Presetting the Picture Levels."

⓭ OVERLOAD lamp

Lights to warn of overloading of the CRT.

⓮ MANUAL lamp

Lights when any of the four MANUAL switches
❾ through ⓬ is depressed.

⓯ INPUT selectors 1 - 4

Select the input signal to be monitored by pressing
one of these buttons.
The requirements of the input signals can be set
with the CONFIGURATION buttons in the drawer
and can be assigned independently to the selectors
and stored in memory through the INPUT
CONFIG menu operation.
See "1-4-2. Setting the Input Configuration."

⓰ POWER switch and lamp

Depress this switch to turn on the power. The lamp
lights. To turn it off, press the switch again.

Section 1 Operation

1-3-2. Rear Panel

4 G/Y/TEST INPUT connectors
5 R/R-Y INPUT connectors
6 B/B-Y INPUT connectors

1 VIDEO A INPUT connectors

7 DECODER OUTPUT connectors

2 VIDEO B INPUT connectors

3 EXT SYNC INPUT connectors

8 REMOTE connector

9 Ground terminal

10 Voltage selector

11 Fuse

12 AC IN connector

The photo shows the BVM-1911. The parts configuration is common to the BVM-2011P.
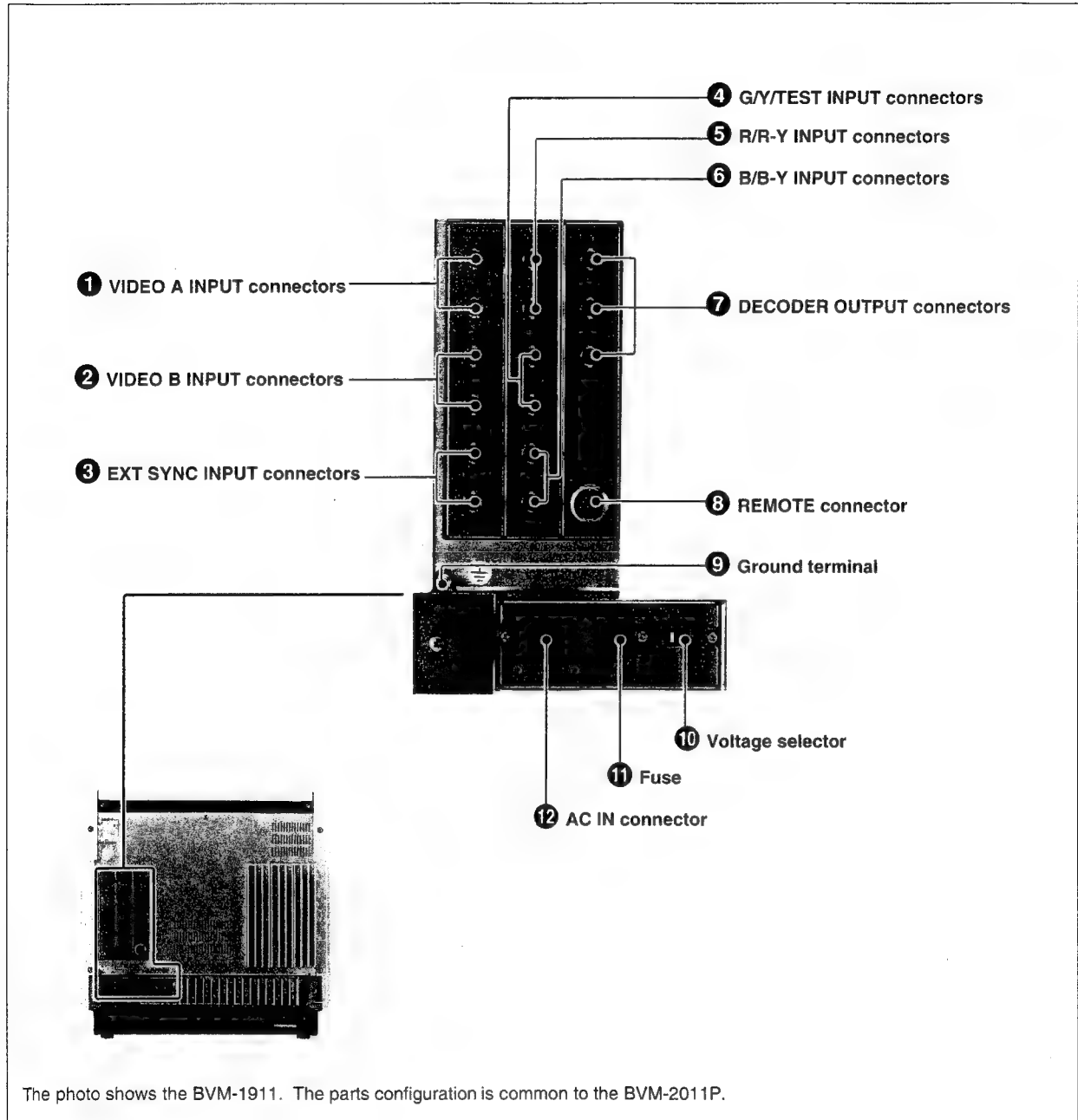
Rear panel

1 VIDEO A INPUT connectors (BNC)
2 VIDEO B INPUT connectors (BNC)
Input composite video signals.
Use one connector of each pair for input and the
other for loop-through output.
When the loop-through output is not used, attach a
75-ohm terminator.

3 EXT SYNC INPUT (external sync input)
connectors (BNC)
Input a sync signal.
Use one connector for input and the other for loop-
through output.
When the loop-through output is not used, attach a
75-ohm terminator.

❹ G/Y/TEST INPUT connectors (BNC)
❺ R/R-Y INPUT connectors (BNC)
❻ B/B-Y INPUT connectors (BNC)
Input RGB video signals, component signals or a composite test signal. The signal format can be selected with the FORMAT button in the drawer. Use one connector of each pair for input and the other for loop-through output.
When the loop-through output is not used, attach a 75-ohm terminator.

❼ DECODER OUTPUT connectors (BNC)
Output RGB or component (Y, R-Y, B-Y) outputs decoded from the composite (VIDEO A, VIDEO B or TEST) or component signals being displayed on the screen with the BKM-1440 RGB/component adaptor installed.
The RGB or component outputs are selected with the S1 selector on the BF board of the BKM-1440 kit.
To provide RGB output, set the S1 selector to the upper position.
To provide component output, set it to the lower position.

Notes
● The DECODER OUTPUT connectors do not provide the correct RGB outputs when RGB signals are displayed on the screen. To obtain the correct RGB outputs, use the loop-through outputs of the R, G and B INPUT connectors.
● The outputs obtained from noncomposite signals are also noncomposite. Supply a sync signal from the EXT SYNC INPUT connector when required.
● The output signals are affected by the CHROMA, PHASE and APERTURE controls and MATRIX switch.
● The color killer circuit is not activated for output signals.

❽ REMOTE connector
Connect to an external control device using the supplied 10-pin connecter.
To enter remote control mode, press the LOCAL/REMOTE button in the drawer so that the associated lamp lights.
The input mode and the pin assignment can be set through the REMOTE menu operation.
See "1-4-6. Assigning the Remote Control Functions."

❾ Ground terminal
Connect to the system ground, when required.

❿ Voltage selector
Set to 100-120 V AC for the BVM-1911 or 220-240 V AC for the BVM-2011P.

⓫ Fuse
Use a 4A fuse for the BVM-1911 or a T2A fuse for the BVM-2011P.

⓬ AC IN connector
Connect the supplied AC power cord here and secure it with the supplied cord stopper.

to an AC outlet
AC power cord
1 Plug in.
Plug holder
2 Lock with the cord stopper.
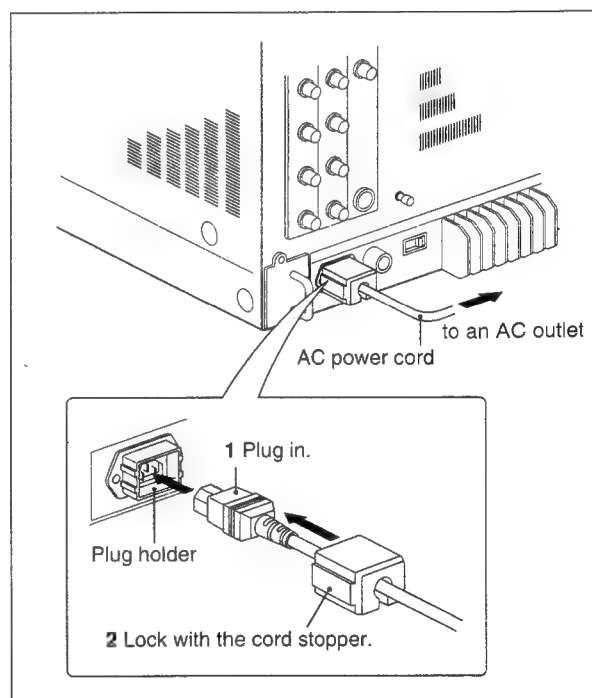
NOTICE
THIS NOTICE IS APPLICABLE FOR THE USA ONLY.
If shipped to the USA, use the UL LISTED power cord specified below for 220 - 240 V AC operation.

DO NOT USE ANY OTHER POWER CORD.

Plug cap	Tandem blade with ground pin
Cord	Type SJT, three 16 or 18 AWG Wires
Length	Maximum 15 feet
Rating	Minimum 10 A, 250 V AC

Section 1 Operation

1-3-3. Subcontrol Panels inside the Drawer

Insert the supplied drawer key into the keyhole of the drawer lock, turn it 90° clockwise and pull the drawer out.
Adjust the button and controls on the subcontrol panels when the monitor is fully warmed up. Warm-up time will be at least 30 minutes after the power has been turned on.

Subcontrol panels
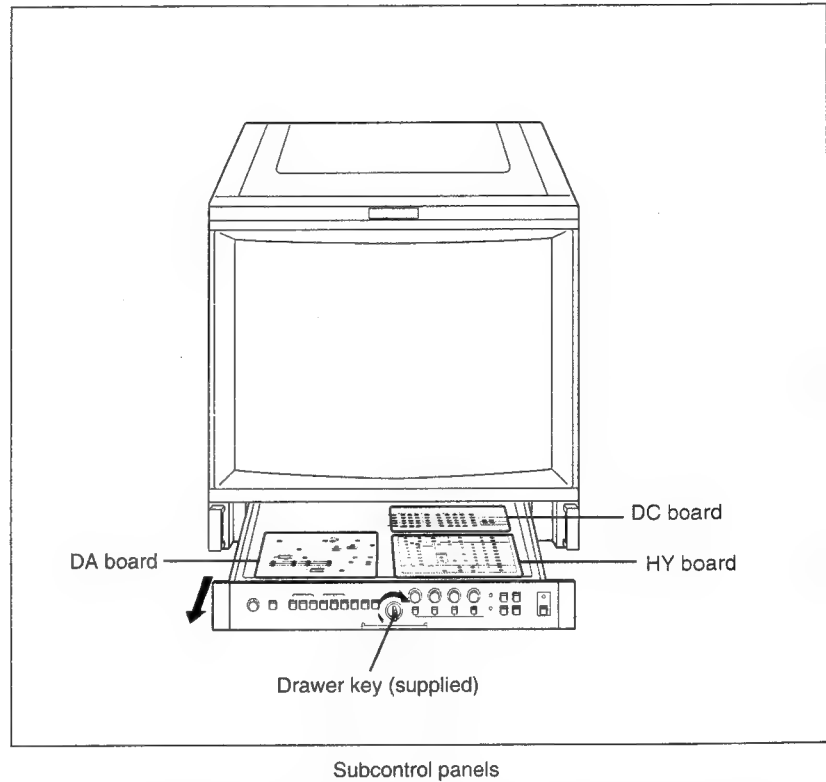
For turning the controls on the DA and DC boards, use the supplied screwdriver.

HY board (input configuration, menu and auto setup operation section)

1 BLUE/POSITION buttons

2 GREEN/LEVEL buttons

3 RED/ADJUST buttons

4 GAIN and BIAS buttons and lamps

5 WHITE/1 button and lamp

6 GRAY/2 button and lamp

28 PIC SETUP button and lamp

7 FORMAT/3 button and lamp

27 S.A.D/VITC/MARKER button and lamp

8 INPUT/4 button and lamp

26 FILTER button and lamp

9 SYNC/5 button and lamp

25 MATRIX button and lamp

10 SYSTEM/6 button and lamp

24 PAL S/SECAM F/COMB S button and lamp

11 YC SEP/7 button and lamp

23 CROSSHATCH button and lamp

12 WHITE BALANCE/8 button and lamp

22 SPLIT SCREEN button and lamp

13 ASPECT/9 button and lamp

21 ASU lamps

14 LOCAL/REMOTE/0 button and lamp

20 RESET button

15 MENU button

16 ESC button

17 SEL button

18 ENT button

19 ⇩ button

HY board

1 BLUE/POSITION buttons

When adjusting white balance (the GAIN or BIAS lamp is lit), use these buttons to adjust the blue signal.
When adjusting the black level (the PIC SETUP lamp is lit), use them to adjust the position of the input signal checking zone.

2 GREEN/LEVEL buttons

When adjusting white balance (the GAIN or BIAS lamp is lit), use these buttons to adjust the green signal.
When adjusting the black level (the PIC SETUP lamp is lit), use them to adjust the brightness of the black reference area.

❸ RED/ADJUST buttons

When adjusting white balance (the GAIN or BIAS lamp is lit), use these button to adjust the red signal.

When the safe area is displayed (the S.A.D/VITC/ MARKER lamp is lit), use them to adjust the safe area size.

❹ GAIN and BIAS buttons and lamps

When adjusting the white balance, select the adjustment items.

BIAS: Adjust the white balance at the lowlight and brightness of the screen.

GAIN: Adjust the white balance at the highlight and contrast of the screen.

For the adjustments, use the BLUE/POSITION, GREEN/LEVEL and RED/ADJUST buttons.

❺ WHITE/1 button[1] and lamp

When adjusting the white balance at the highlight, press this button so that the lamp lights. The internal 100% white signal is displayed on the screen. To turn off the signal, press the button again.

❻ GRAY/2 button[1] and lamp

When adjusting the white balance at the lowlight, press this button so that the lamp lights. The internal gray signal is displayed on the screen. To turn off the signal, press the button again.

❼ FORMAT/3 button[1] and lamps

Select the signal format according to the signal to be monitored. Press this button so that the lamp of the appropriate format lights.

CODED: For monitoring NTSC, PAL or SECAM signal with the decoder board (BC, BD, BE or BM) installed.

YUV: For monitoring Y/R-Y/B-Y component signals.

RGB: For monitoring RGB signals.

D-1: For monitoring D-1 format component signals.

D-2: For monitoring a D-2 format composite signal.

❽ INPUT/4 button[1] and lamps

When monitoring a composite signal, select the input connector.

Press this button so that the lamp of the appropriate connector lights.

A: For monitoring the signal connected to the VIDEO A INPUT connector.

B: For monitoring the signal connected to the VIDEO B INPUT connector.

TEST: For monitoring the test signal connected to the G/Y/TEST connector.

❾ SYNC/5 button[1] and lamp

Select the sync mode. Press this button so that the lamp of the appropriate mode lights.

INT (internal sync mode): The unit operates in synchronization with the sync signal of the composite signal being displayed on the screen.

EXT (external sync mode): The unit operates in synchronization with the sync signal supplied from the EXT SYNC INPUT connector.

❿ SYSTEM/6 button[1] and lamps

When monitoring a composite signal or a signal decoded with a decoder board (BC, BD, BE or BM), select the color system according to the signal to be monitored. Press this button so that the lamp of the appropriate system lights.

NTSC: For monitoring a signal of the NTSC color system.

PAL: For monitoring a signal of the PAL color system.

SECAM: For monitoring a signal of the SECAM color system.

Note

If the decoder board for the selected color system has not been installed:

• The picture does not appear when the FILTER lamp is lit (FILTER ON).

• The picture is displayed in monochrome when the FILTER lamp is not lit (FILTER OFF).

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1) These buttons also function as numeric keys when specifying the password.
See "1-4-5. Changing and Applying the Password."

⓫ YC SEP(Y/C separation filter)/7 button[1) and lamps

For NTSC or PAL signal, select the filter to be used for Y/C separation. Press the button so that the lamp of the appropriate filter lights.

COMB: To use the comb filter with the comb filter board (BB or BT) installed.

TRAP: To use the built-in trap filter.

Note

When the appropriate comb filter board has not. been installed, the trap filter is activated regardless of the setting with this button.

⓬ WHITE BALANCE/8 button[1) and lamps

Select the white balance and picture levels stored in the respective registers. Press this button so that the lamp of the appropriate register lights.

At the factory, the white balance for D6500 has been stored in all the registers.

D65/D93 R0: To use the white balance and picture levels stored in register 0.

MEM 1 R1: To use the white balance and picture levels stored in register 1.

MEM 2 R2: To use the white balance and picture levels stored in register 2.

MEM 3 R3: To use the white balance and picture levels stored in register 3.

For details, see "1-4. Menu Operations."

⓭ ASPECT/9 button[1) and lamps

Select the aspect ratio of the picture to be monitored. Press this button so that the lamp of the appropriate ratio lights.

4:3: For the 4:3 aspect

16:9: For the 16:9 aspect.

⓮ LOCAL/REMOTE/0 button[1) and lamp

To enable the monitor to be controlled from an external control device connected to the REMOTE connector on the rear panel, press this button so that the lamp lights (REMOTE mode). To disable the remote control (LOCAL mode), press the button again.

For the remote control functions, see "1-4-6. Assigning the Remote Control Functions."

⓯ MENU button

Press to initiate menu operations. The initial menu is displayed.

⓰ ESC (escape) button

Press to quit menu or auto setup operations.

⓱ SEL (select) button

Press to set the monitor to color temperature selection mode in auto setup operations. In color analyzer mode, select the memory position of the probe connected to the AUTO SETUP PROBE connector.

For details, refer to the operation and maintenance manual of the BKM-2056 auto set-up adaptor.

⓲ ENT (enter) button

Press to proceed to the next step during menu or auto setup operation and save the data.

⓳ ⇓ (cursor) button

For selecting menu options displayed on the screen in menu or auto setup operations. Each time this button is pressed, the cursor moves downwards and, if at the bottom, jumps to the top.

⓴ RESET button

Press to reset an auto setup operation.

㉑ ASU (automatic setup) lamps

CHROMA/PHASE: Lights when the automatic chroma and phase adjustment is completed with AUTO CHROMA/PHASE in auto setup operations. The lamp goes off when MANUAL is selected on the SELECT MONITOR MEM menu is selected in auto setup operations.

WHITE BAL: Lights when one of the color temperature to be transfered to the monitor by the auto white balance adjustment is selected on the SELECT MONITOR MEM menu in auto setup operations. When this lamp is lit, the color temperature selection on the SELECT MONITOR MEM menu can be performed using the WHITE BALANCE/8 button.

---

1) These buttons also function as numeric keys when specifying the password.
See "1-4-5. Changing and Applying the Password."

❷❷ SPLIT SCREEN button and lamp

To display the lower half of the picture in monochrome mode, press this button so that the lamp lights. Press this button again to resume the normal picture.

❷❸ CROSSHATCH button and lamp

To display the internal crosshatch pattern for convergence adjustment, press this button so that the lamp lights.

The crosshatch pattern is synchronized with the selected composite sync signal.

To turn off the pattern, press the button again.

❷❹ PAL S/SECAM F/COMB S button and lamp

While monitoring a PAL signal, the demodulation mode of the the PAL system can be switched. When this button is pressed and the lamp lights, S (simple) mode is selected. By pressing the button to turn off the lamp, D (deluxe) mode is selected.

While monitoring a SECAM signal, the ID signal of the the SECAM system can be switched. When this button is pressed and the lamp lights, the F (field) signal is selected. By pressing the button to turn off the lamp, the L (line) signal is selected.

When the BKM-1411/1412 NTSC comb filter is activated, the comb filter mode can be switched. When this button is pressed and the lamp lights, the S (simple) comb filter is selected. By pressing the button to turn off the lamp, the D (dynamic) comb filter is selected.

❷❺ MATRIX button and lamp

Should normally be OFF (lamp not lit).

By pressing this button so that the lamp lights (ON), the matrix circuit is activated and the chromaticity of the displayed picture more closely approximates to that of "true" NTSC phosphors. To turn off the matrix circuit, press the button again.

❷❻ FILTER button and lamp

To activate the comb or trap filter (selected with the YC SEP button) in MONO mode (MONO MODE switch on the front panel depressed), press this button so that the lamp lights.

To deactivate the filter for a wider frequency range, press the button again.

Note

In AUTO mode (the MONO MODE switch released), the filter is always activated for color signals regardless of the setting with this button.

❷❼ S.A.D (safe area display)/VITC/MARKER button and lamp

When the safe area is displayed with the BQ board (BKM-1470 safe area display) installed, the adjustment of the safe area size can be enabled.

When the BL board (BKM-1460 VITC adaptor) has been installed, the VITC display can be turned on and off.

❷❽ PIC SETUP (picture setup) button and lamp

Use to match the black reference of the monitor with the black level of the input signal to be monitored.

By pressing this button so that the lamp lights, a vertical picture band and the black reference of the monitor are displayed on the screen for easy level comparison.

See "1-6-2. Black Level Adjustment."

DC board (Convergence adjustment section)
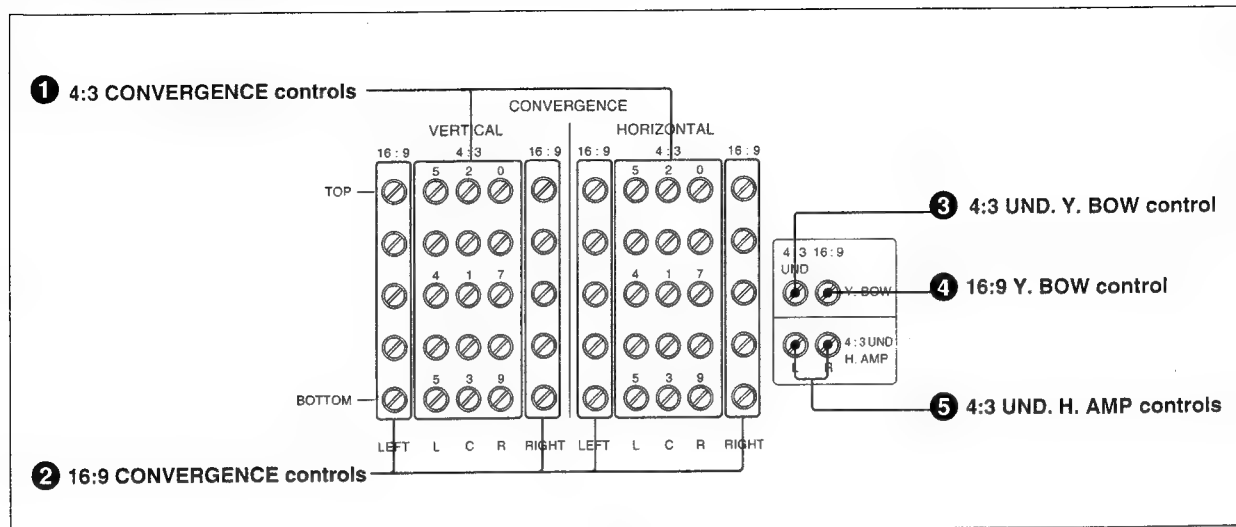
DC board

❶ 4:3 CONVERGENCE controls
Adjust the convergence of the 4:3-aspect normal picture. The VERTICAL controls adjust the convergence vertically and the HORIZONTAL controls adjust it horizontally. Fifteen controls cover the entire screen so that each control adjusts the corresponding portion of the screen.
See "1-5. Convergence Adjustments."

❷ 16:9 CONVERGENCE controls
Adjust the convergence of the 16:9-aspect picture at the right and left portions of the screen after adjusting it at the center of the picture using the 4:3 CONVERGENCE controls.
The VERTICAL controls adjust the convergence vertically and the HORIZONTAL controls adjust it horizontally.
See "1-5-3. Convergence of a 16:9-Aspect Picture."

❸ 4:3 UND. Y. BOW (underscan Y bow) control
Adjust the horizontal convergence at the top and bottom of the center of the 4:3-aspect underscanned picture.
See "1-5-2. Convergence of a 4:3-Aspect Underscanned Picture."

❹ 16:9 Y. BOW control
Adjust the horizontal convergence at the top and bottom of the center of the 16:9-aspect picture.
See "1-5-3. Convergence of a 16:9-Aspect Picture."

❺ 4:3 UND. H. AMP (underscan horizontal amplifier) controls
Adjust the horizontal convergence of the underscanned picture of the 4:3-aspect.
See "1-5-2. Convergence of a 4:3-Aspect Underscanned Picture."

Section 1 Operation

DA board (H.V. oscillator section)

1 AFC selector
2 H. PHASE control
3 H. LIN control
4 H. BLK PHASE control
5 SIDE PIN TILT control
6 H. WIDTH controls
7 V. HEIGHT controls
8 SIDE PIN controls
9 T&B PIN controls
10 APERTURE control

11 H. BLK WIDTH control
12 T/B BAL control
13 ▭ control
14 ▭ control
15 V. LIN GAIN control
16 V. LIN BAL control
17 H. CENTER control
18 H. CENT LIN control
19 V. CENTER control
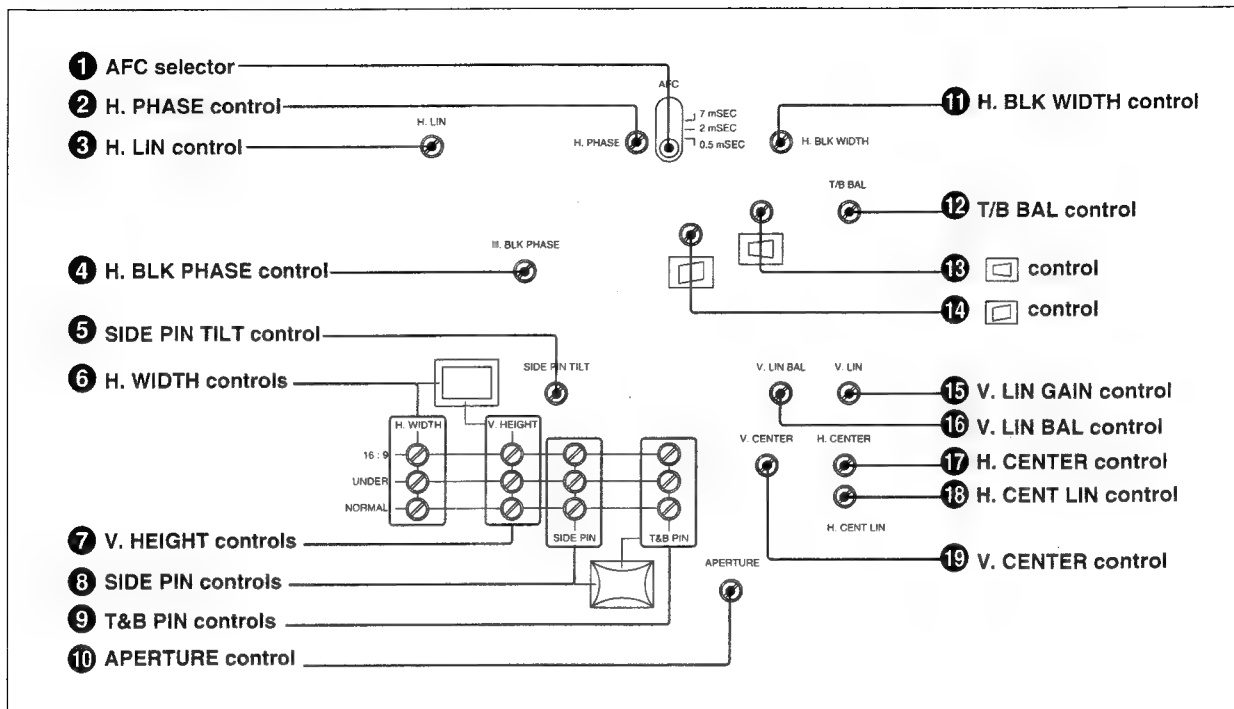
DA board

1 **AFC (automatic frequency control) selector**
Select the AFC time constant.
0.5 mSEC (fast): This mode is fast enough to compensate for VTR jitter. Set to this position to obtain a stable playback picture from a VTR.
2 mSEC (normal): Normally set to this position.
7 mSEC (slow): This mode is slow enough to display the time base instability introduced by mechanical jitter in the VTR playback signal.

2 **H. PHASE (horizontal phase) control**
Adjust the horizontal position of the picture.
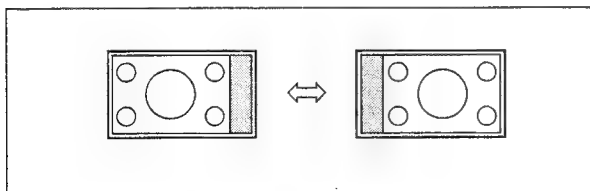
3 **H. LIN (horizontal linearity) control**
Adjust the horizontal linearity of the picture.
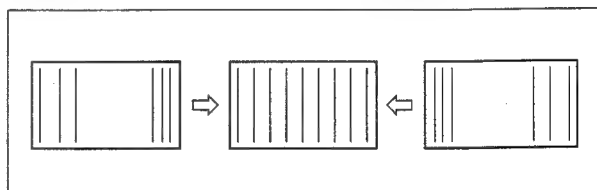
4 **H. BLK PHASE (horizontal blanking phase) control**
Adjust the phase of the horizontal blanking at both sides of the screen.
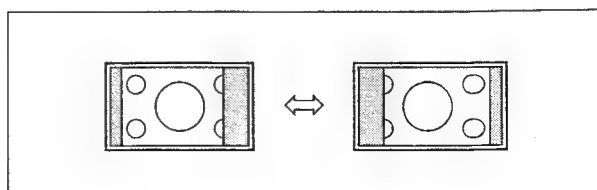
❺ SIDE PIN TILT (side pincushion tilt) control
Adjust the phase of the side pincushion distortion.
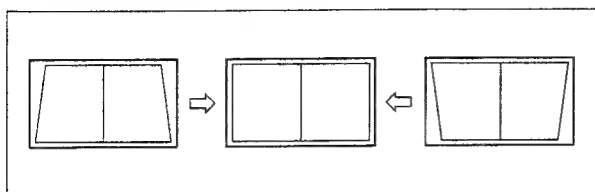
❻ H. WIDTH (horizontal width) controls
Adjust the horizontal width of the picture. Use the NORMAL control for the 4:3-aspect normal picture, the UNDER control for the 4:3-aspect underscanned picture and the 16:9 control for the 16:9-aspect picture.

❼ V. HEIGHT (vertical height) controls
Adjust the height of the picture. Use the NORMAL control for the 4:3-aspect normal picture, the UNDER control for the 4:3-aspect underscanned picture and the 16:9 control for the 16:9-aspect picture.

❽ SIDE PIN (pincushion) controls
Correct the side pincushion distortion. Use the NORMAL control for the 4:3-aspect normal picture, the UNDER control for the 4:3-aspect underscanned picture and the 16:9 control for the 16:9-aspect picture.

❾ T&B PIN (top and bottom pincushion) distortion controls
Correct the top and bottom pincushion distortion. Use the NORMAL control for the 4:3-aspect normal picture, the UNDER control for the 4:3-aspect underscanned picture and the 16:9 control for the 16:9-aspect picture.

❿ APERTURE control
Adjust the frequency response when the APERTURE switch on the front panel is depressed.

⓫ H. BLK WIDTH (horizontal blanking width) control
Adjust the width of the horizontal blanking.
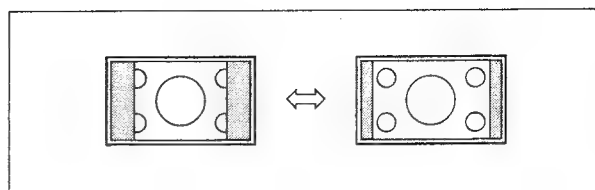
⓬ T/B BAL (top and bottom pincushion balance) control
Adjust the distortion at the center (X axis) of the picture.
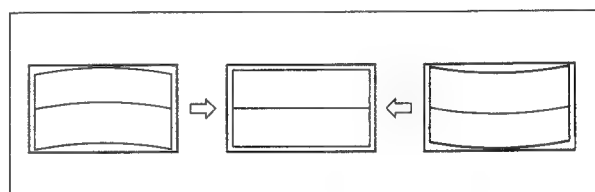
⓭ ▢ (trapezoid distortion) control
Correct the horizontal trapezoid distortion.
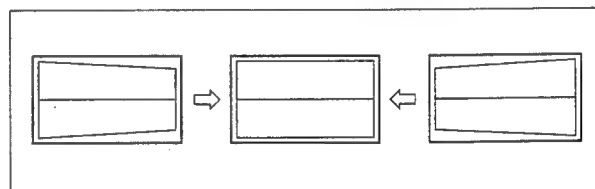
⓮ ▢ (parallelogram distortion) control
Correct the right angled distortion of the deflection yoke.
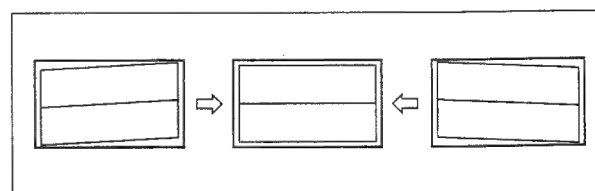
⓯ V. LIN GAIN (vertical linearity gain) control
Adjust the vertical linearity of the picture.
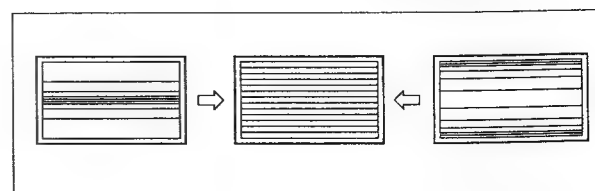
⑯ V. LIN BAL (vertical linearity balance) control

Adjust the balance of the vertical (Y axis) linearity of the picture.
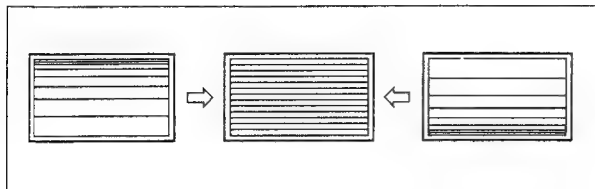
⑰ H. CENTER (horizontal centering) control

Adjust the horizontal position of the picture.

⑱ H. CENT LIN (horizontal centering linearity) control

Adjust the horizontal linearity at the center of the picture.
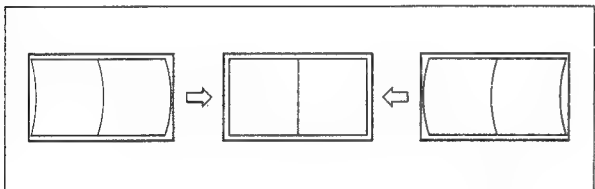
⑲ V. CENTER (vertical centering) control

Adjust the vertical position of the picture.

1-3-4. Switches inside the Cabinet

To access to the switches on the boards inside the cabinet, see Section 2.

BJ board
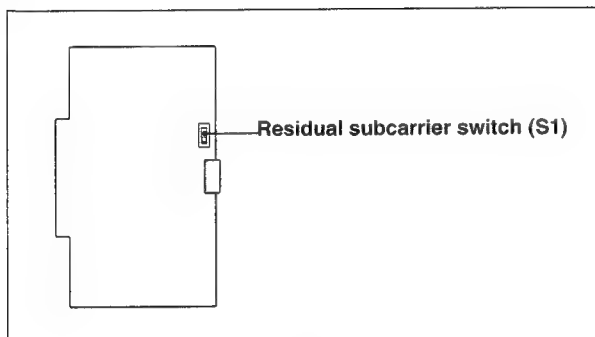
BJ board

Residual subcarrier switch (S1)
This switch is factory-preset to the lower position (OFF).
Normally there will be no residual subcarrier in input video signals. However, whether a residual subcarrier is preset, this may affect the display.
Set this switch to the upper position (ON) to check if a residual subcarrier is present. If it is present in the incoming signal, color shift appears in the picture.

BH board
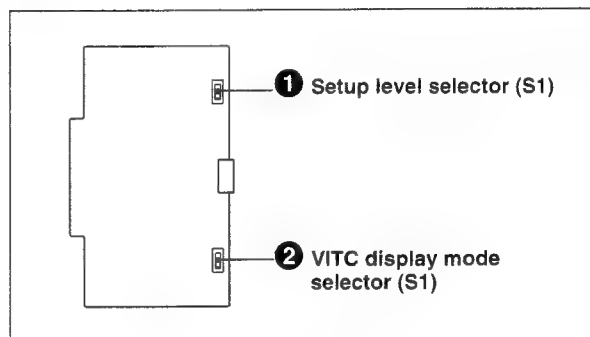
BH board

❶ Setup level selector (S2)
Select the setup level.
0 IRE: The setup level is 0%.
AUTO: The setup level set through the COMPONENT OFFSET or NTSC OFFSET option of the MONITOR CONFIG menu is obtained.
See "1-4-7. Defining the Monitor Configuration."
7.5 IRE: The setup level is 7.5%.
The 0% setup levels can be varied with the RV1 control and 7.5% level with the RV2 control in a range from −2.5% through +12.5%.

❷ VITC display mode selector (S1)
Use to invert the character and background colors for VITC display.
Upper position: Factory-preset position. The VITC is displayed in white characters on a black background.
Lower position: The VITC is displayed in black characters on a white background.
For details, see the operation and maintenance manual of the BKM-1460 VITC adaptor.

Section 1 Operation

BG board
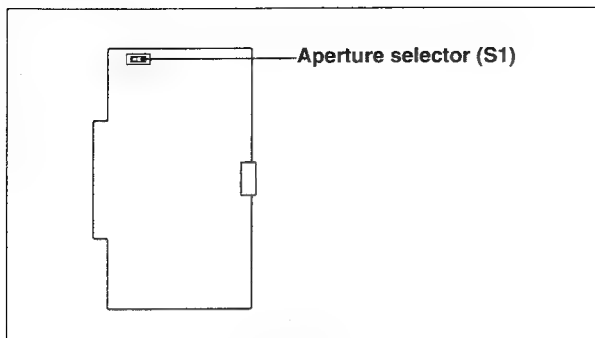
BG board

Aperture selector (S1)

Select the boost frequency, 4.5 MHz or 6.5 MHz, for aperture correction. This selector is factory-preset to 4.5 MHz.

QA and QB boards

The QA board is located behind the VIDEO A, VIDEO B and EXT SYNC INPUT connector panel and the QB board is located behind the R/R-Y, G/Y/TEST and B/B-Y INPUT connector panel. To access these boards, remove the INPUT connector panels, referring to Section 2.
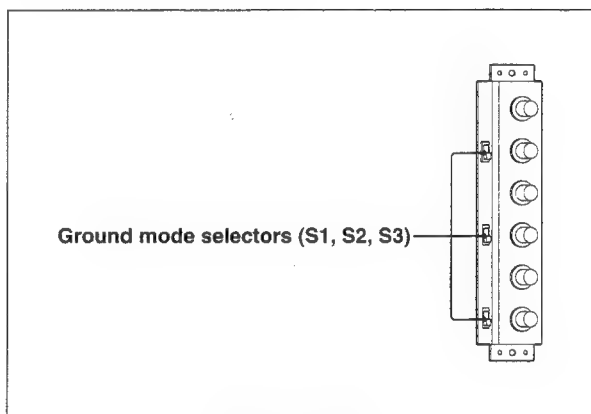
QA and QB boards

Ground mode selectors (S1, S2, S3)

The selectors on the QA board correspond to the VIDEO A, VIDEO B or EXT SYNC INPUT connectors and those on the QB board correspond to the R/R-Y, G/Y/TEST or B/B-Y connectors, respectively.

S (nonfloating): Factory-preset position. Normally keep the selectors at this position.

F (floating): When there is hum in the input signal to be monitored, set to this position. Common mode noise will be rejected.

1-4. Menu Operations

The menu operations permit the various monitor requirements to easily be set by following messages displayed on the screen.

1-4-1. Starting with the menu operations

For the menu operations, use the buttons on the HY board in the drawer and some switches and controls on the front panel.
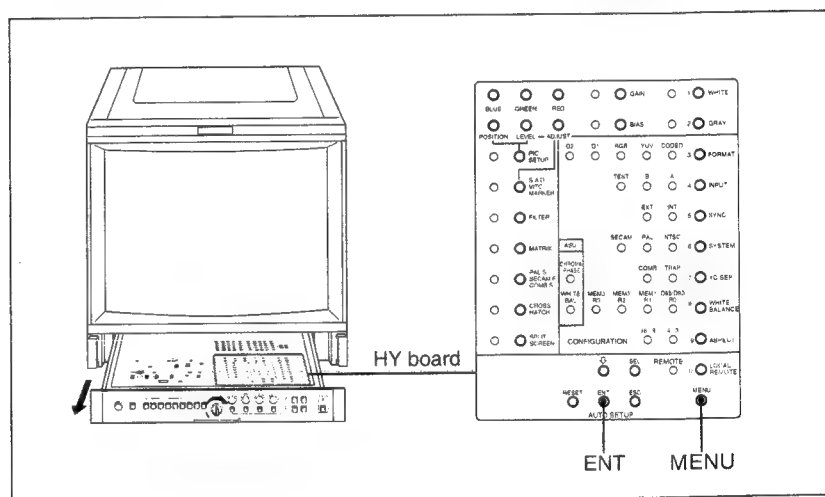
Pressing the MENU button displays the following initial menu showing the items which can be set through the menu operations.

Initial menu
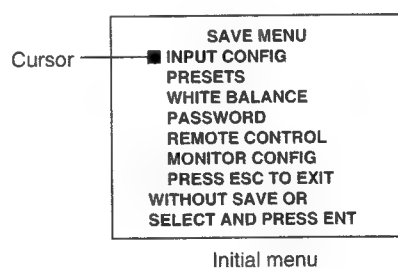
INPUT CONFIG (input configuration): To assign input signals to INPUT selectors 1 to 4 on the front panel.
PRESETS: To adjust the preset values for the phase, chroma, contrast, brightness, and picture setup (black reference) levels.
WHITE BALANCE: To adjust the white balance.
PASSWORD: To specify and activate/deactivate the password.
REMOTE CONTROL: To assign the remote control functions.
MONITOR CONFIG (monitor configuration): To specify operating conditions of the monitor, such as the optional boards to be used and signal setup levels, and to restore the factory-set menu data.

To select a menu option

Move the cursor with the ⇩ button to the line of the desired menu option and press the ENT button.
Pressing the ⇩ button moves the cursor downward and, if at the bottom, to the top.

To cancel the menu operation on the way

Press the ESC button.
At any level of the menu operations, pressing the ESC button cancels the operations without changing any data and restores normal status.

1-4-2. Setting the Input Configuration

At the factory, the following input signals are assigned to INPUT selectors 1 to 4 on the front panel.

Factory-set configuration

Signal	INPUT selectors			
	1	**2**	**3**	**4**
FORMAT	CODED	CODED	COMPONENT	RGB
INPUT	A	B	—	—
SYNC	INT	INT	INT	INT
SYSTEM[a]	NTSC/PAL	NTSC/PAL	—	—
ASPECT	4 : 3	4 : 3	4 : 3	4 : 3
YC SEP[b]	COMB	COMB	—	—

a) NTSC for the BVM-1911 and PAL for the BVM-2011P.
b) Only for BVM-1911. The INPUT selectors 1 and 2 on the BVM-2011P have been set to TRAP.

Using the CONFIGURATION buttons on the HY board in the drawer, these requirements of the input signals (input configuration) can be changed as desired and stored in memory through the INPUT CONFIG menu operation.
The stored configuration is always obtained when the assigned INPUT selector is pressed.
When the change is not stored through the menu operation, the input configuration returns to the previous status when another INPUT selector is pressed.

Operation
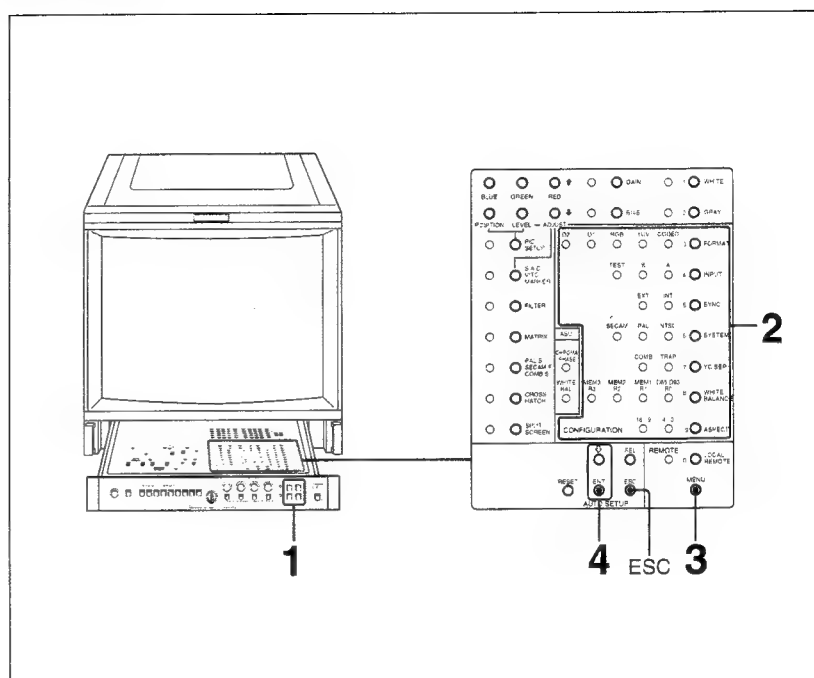
1 Press one of the INPUT selectors on the front panel.

2 Using the following COFIGURATION buttons in the drawer, set the input configuration for the INPUT selector selected in step 1. Press the buttons so that the appropriate lamps light.

FORMAT: Select the signal format (CODED, YUV, RGB, D-1 or D-2).

INPUT: Select the input connector A, B or TEST when you select CODED for FORMAT, or A or B when you select D-1 or D-2 for FORMAT.

SYNC: Select the sync mode (INT or EXT).

SYSTEM: Select the color system (NTSC, PAL or SECAM) when you select CODED or D-2 for FORMAT.

YC SEP: Select the filter when you select NTSC or PAL for the color system.

WHITE BALANCE: Select the register (R0, R1, R2 or R3) on which the desired white balance has been stored.
See "1-4-4. Selecting the White Balance."

ASPECT: Select the picture aspect (4:3 or 16:9).

3 When the settings are completed, press the MENU button. The initial menu is displayed.

4 Should the cursor on the initial menu not be located at INPUT CONFIG, press the ⇩ button until it returns to INPUT CONFIG, and press the ENT button.

Note

If the message "PLEASE ENTER PASSWORD" is displayed, enter the password.
See "1-4-5. Changing and Applying the Password."

The input configuration set in step 2 for the INPUT.selector selected in step 1 is now stored in memory.
The message "DATA SAVED" is momentarily displayed and the monitor returns to normal status.

Repeat this procedure for the other INPUT selectors as desired.

To cancel the operation
Press the ESC button before pressing the ENT button in step 4.

1-4-3. Presetting the Picture Levels

The four sets of the phase, chroma, brightness, contrast, and picture setup (black reference) levels can be set and stored in Registers R0 to R3 through the PRESETS menu operation.

Operation
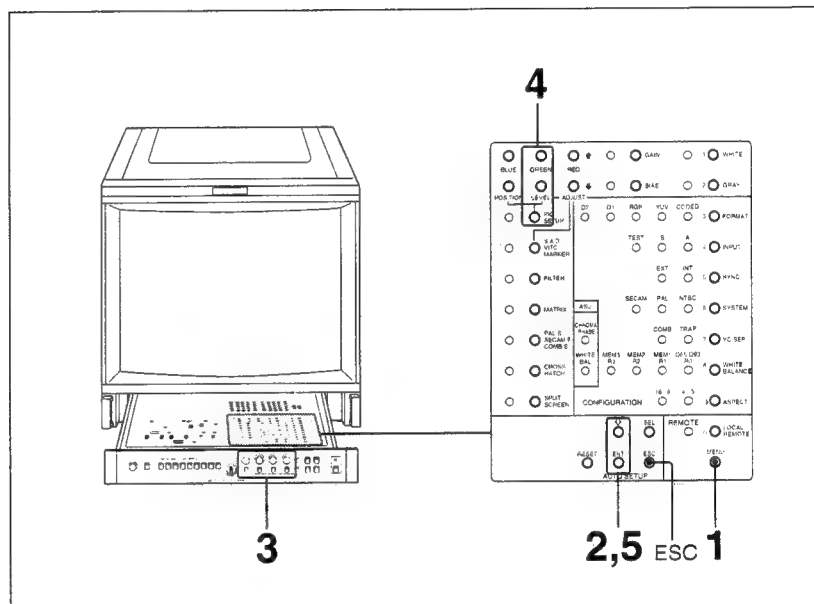
1 Press the MENU button.
The initial menu is displayed.

2 Press the ⇓ button until the cursor reaches PRESETS, then press the ENT button.
The SAVE PRESETS menu is displayed.

```
        SAVE PRESETS
  ■ TEXT ON/OFF
      DATA REGISTER  R0 *
      DATA REGISTER  R1
      DATA REGISTER  R2
      DATA REGISTER  R3
  PHASE    100   BRIGHT     100
  CHROMA 100    CONTRAST 100
      PICTURE SETUP LEVEL  100
      SELECT AND PRESS ENT
```

An asterisk indicates the register which is currently selected with the WHITE BALANCE button. The levels stored in this register are displayed as numerical values on the lower half of the menu display.

Note

If the message "PLEASE ENTER PASSWORD" is displayed, enter the password.
See "1-4-5. Changing and Applying the Password."

3 Depress the PHASE, CHROMA, BRIGHTNESS and CONTRAST MANUAL switches and turn the respective controls so that the desired levels are obtained.

4 Press the PIC SETUP button so that the associated lamp lights and adjust the setup level for the picture by pressing the LEVEL buttons.

Note

The adjustments in steps 3 and 4 can be precisly performed while observing the numeric level indications (0 through 200, centering with 100) on the lower half of the menu display.
To adjust while observing the picture on the screen, set the cursor to TEXT ON/OFF and press the ENT button, and the SAVE PRESETS menu disappears.
For the picture setup level, follow the procedure in "1-6-2. Black Level Adjustment."
To return to the SAVE PRESETS menu, press the ENT button again.

5 Move the cursor to the register in which the set levels are to be stored and press the ENT button.

The levels set in steps 3 and 4 are now stored in the register selected in step 5.
The message "DATA SAVED" is momentarily displayed, and the monitor returns to normal status.

Repeat this procedure for the other registers as desired.

To cancel the operation
Press the ESC button before pressing the ENT button in step 5.

1-4-4. Selecting the White Balance

The four settings for white balance can be stored in Registers R0 to R3. At the factory, the setting for D6500 has been stored in all the registers

Note

The settings for white balance are stored in combination with the picture levels set through the PRESETS menu operation in the same Registers R0 through R3.

Operation
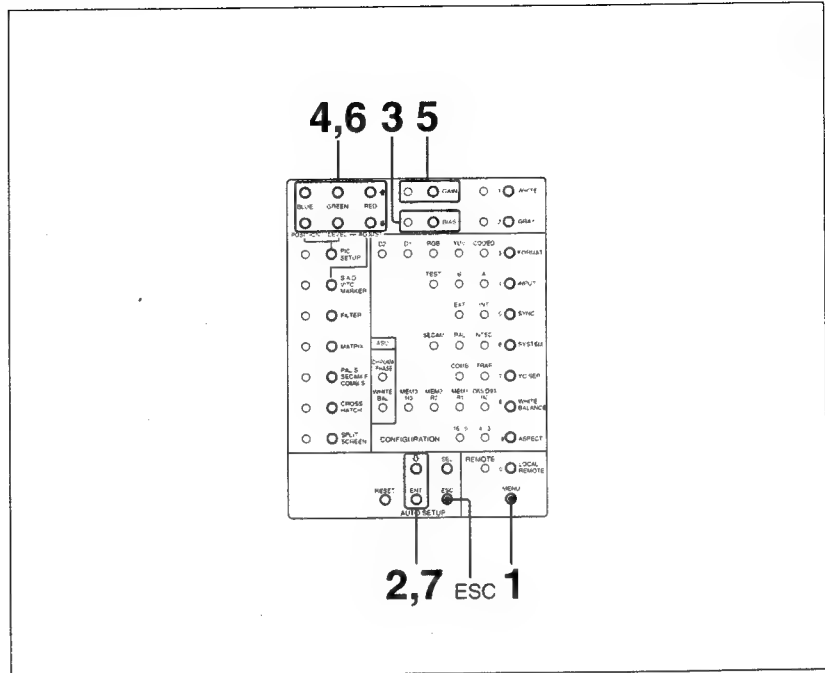
1 Press the MENU button.
The initial menu is displayed.

2 Press the ⇓ button until the cursor reaches WHITE BALANCE, then press the ENT button.
The SAVE WHITE BALANCE menu is displayed.

```
SAVE WHITE BALANCE
■ TEXT ON/OFF
  DATA REGISTER  R0 *
  DATA REGISTER  R1
  DATA REGISTER  R2
  DATA REGISTER  R3
R: – GAIN  100      BIAS  100
G: – GAIN  100      BIAS  100
B: – GAIN  100      BIAS  100
  SELECT AND PRESS ENT
```

An asterisk indicates the register which is currently selected with the WHITE BALANCE button. The levels stored in this register are displayed as numerical values on the lower half of the menu display.

Note
If the message "PLEASE ENTER PASSWORD" is displayed, enter the password.
See "1-4-5. Changing and Applying the Password."

3 Press the BIAS button.
The associated lamp lights.

4 Adjust the R, G and B bias levels by pressing the RED, GREEN and BLUE buttons.

5 Press the GAIN button.
The associated lamp lights.

6 Adjust the R, G and B signal gain levels by pressing the RED, GREEN and BLUE buttons.

Note

These adjustments in steps 3 through 6 can be precisely performed while observing the numeric level indications (0 through 200, centering with 100) on the lower half of the menu display.
To adjust while observing the picture on the screen, set the cursor to TEXT ON/OFF and press the ENT button, and the SAVE WHITE BALANCE menu disappears.
Then, adjust the white balance by following the procedure in "1-6-1. White Balance Adjustment."
To return to the SAVE WHITE BALANCE menu, press the ENT button again.

7 Move the cursor to the register in which the set white balance is to be stored and press the ENT button.

The white balance set in steps 3 through 6 is now stored in the register selected in step 7.
The message "DATA SAVED" is momentarily displayed, and the monitor returns to normal status.

Repeat the above procedure for the other registers as desired.

To cancel the operation
Press the ESC button before pressing the ENT button in step 7.

1-4-5. Changing and Applying the Password

The password can be specified and applied to the desired menu option to prohibit the menu settings from being changed without permission. The password can be any desired four-digit number, which is entered by using the function buttons having additional numeric indications on the HY board.

The message **"PLEASE ENTER PASSWORD"** is displayed when you try to select the options for which the password has been applied, from the initial menu.

If an incorrect password is entered or the password is not entered within about 5 seconds after the above message is displayed, the message **"INCORRECT ENTRY"** is momentarily displayed and the menu operation is canceled.

To change the password

"9999" has been specified for the password at the factory. Change it to your desired four-digit number as follows.
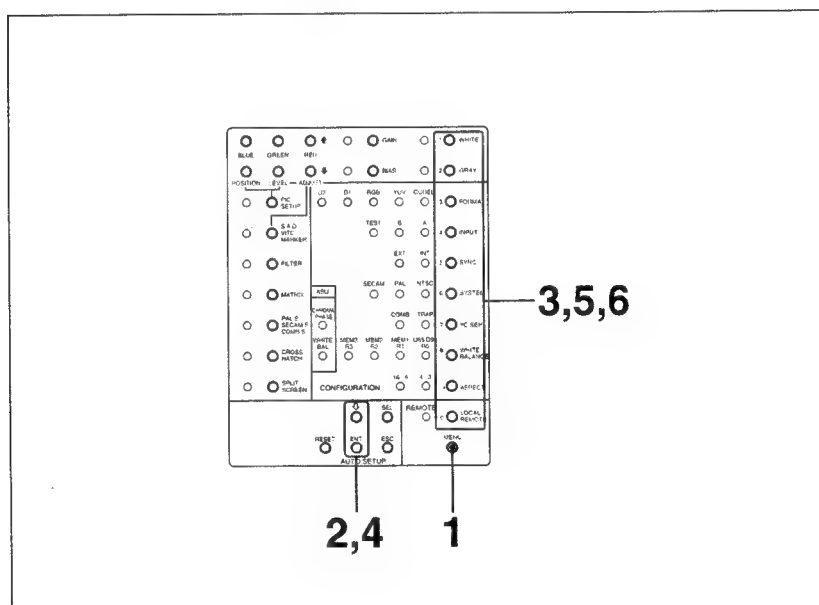
1 Press the MENU button.
The initial menu is displayed.

2 Press the ⇩ button until the cursor reaches PASSWORD, then press the ENT button.
The message "ENTER PASSWORD" is displayed.

3 Enter the current password (Factory-set: 9999).
The PASSWORD MENU is displayed.

```
          PASSWORD MENU

     ■ CHANGE PASSWORD
        APPLY PASSWORD




        SELECT AND PRESS ENT
```
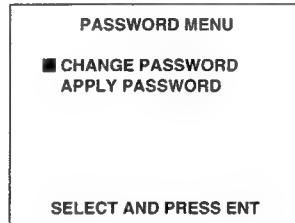
4 Select the CHANGE PASSWORD option.
The message "ENTER NEW PASSWORD" is displayed.

5 Enter any desired four-digit number as your new password using the buttons labeled 0 to 9.
The message "PLEASE RE-ENTER NEW PASSWORD TO CONFIRM" is displayed.

6 Enter the new password again.
The message "PASSWORD CHANGED" is displayed and the new password is now valid.

Note

If an incorrect password is entered, "INCORRECT ENTRY. PASSWORD NOT CHANGED" is displayed and the menu operation is canceled.

To cancel the operation
Press the ESC button before re-entering the new password in step 6.

To apply the password

The specified password can be activated/deactivated independently for each of the initial menu options and, with the BKM-2056 installed, the auto setup option.

1 Preform steps 1 through 3 mentioned in "To change the password."

2 By pressing the ⇩ button and then ENT button, select the APPLY PASSWORD option.
The APPLY PASSWORD menu is displayed.

```
┌─────────────────────────────┐
│      APPLY PASSWORD         │
│ ■ INPUT CONFIG      NO      │
│   WHITE BALANCE     NO      │
│   PRESETS           NO      │
│   AUTO SETUP        NO      │
│   REMOTE CONTROL    NO      │
│   MONITOR CONFIG    NO      │
│   SAVE AND APPLY           │
│                             │
│   SELECT AND PRESS ENT     │
└─────────────────────────────┘
```

NO is displayed for each option for which the password is not activated.
YES is displayed for each option for which the password is activated.

3 By pressing the ⇩ button, move the cursor to the option for which the password application is to be changed.

4 Press the ENT button to change NO to YES or vice virsa.
(Pressing the button toggles the YES/NO setting.)

Repeat steps 3 and 4 for the other options as desired.

5 When the password application setting is completed, move the cursor to SAVE AND APPLY and press the ENT button.
The message "PASSWORD APPLIED" is momentarily displayed, and the monitor returns to normal status.

To cancel the operation
Press the ESC button before pressing the ENT button in step 5.

Section 1 Operation

1-4-6. Assigning the Remote Control Functions

The remote control function is available either in STANDARD PARALLEL or CONFIGURE PARALLEL mode.
The mode change is achieved through the REMOTE CONTROL menu operation.
The SERIAL REMOTE option mode in the REMOTE CONTROL menu is provided for future use. If you inadvertently select it, cancel the REMOTE CONTROL menu by pressing the ESC button.

STANDARD PARALLEL mode

The remote control function is set to the STANDARD PARALLEL mode and the following functions are assigned to the pins of the REMOTE connector at the factory.
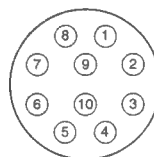
Pin assignment

Function			Pin No.						
INPUT	SYNC	MODE	1	2	3	4	5	6	7
INPUT 1	INT	AUTO	O	O	–	O	S	–	–
		MONO	S	O	–	O	S	–	–
	EXT	AUTO	O	O	–	S	S	–	–
		MONO	S	O	–	S	S	–	–
INPUT 2	INT	AUTO	O	S	–	O	S	–	–
		MONO	S	S	–	O	S	–	–
	EXT	AUTO	O	S	–	S	S	–	–
		MONO	S	S	–	S	S	–	–
VITC OFF			–	–	–	–	–	S	–
VITC HOLD			–	–	–	–	–	O	S
TALLY ON			–	–	S	–	–	–	–

S: Short-circuit with pin No.8
O: Open
–: Either S or O

The assigned function can be controlled by short-circuiting the corresponding pin with pin 8.
Note that pin 3 is fixed to TALLY and pin 8 is fixed to GND.

The remote control operations have priority over the respective buttons and switches of the monitor.

CONFIGURE PARALLEL mode

The functions of the buttons or switches on the front panel or in the drawer listed below can be assigned to pins 1, 2 and 4 through 7, as desired.

Front panel
INPUT selectors 2 to 4 (input selection)
MONO MODE switch (AUTO/MONO mode switching)

HY board inside the drawer
WHITE button (ON/OFF)
SYNC button (INT/EXT sync mode switching)
YC SEP button (COMB/TRAP filter switching)
ASPECT button (16:9/4:3 picture aspect switching)
S.A.D /VITC/MARKER button (S.A.D. or VITC ON/OFF)
FILTER button (ON/OFF)
MATRIX button (ON/OFF)
PAL S/SECAM F/COMB S button (mode or type switching)
CROSSHATCH button (ON/OFF)
SPLIT SCREEN button (ON/OFF)

Operation
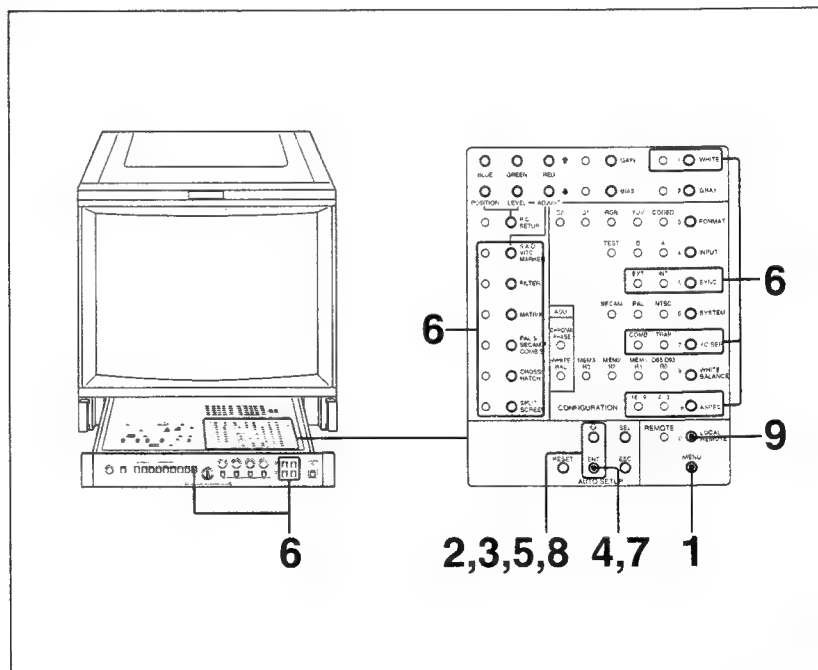
1 Press the MENU button to display the initial menu.

2 Move the cursor to REMOTE CONTROL and press the ENT
button.
The REMOTE CONTROL MENU is displayed.

```
REMOTE CONTROL MENU

■ SERIAL REMOTE
  STANDARD PARALLEL
  CONFIGURE PARALLEL


  SELECT AND PRESS ENT
```
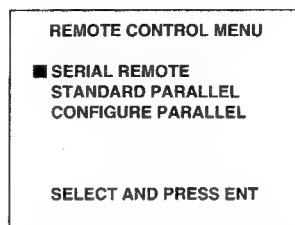
Note that SERIAL REMOTE is for future use.

3 **To change the pin assignment of the REMOTE connector,**
move the cursor to CONFIGURE PARALLEL and press the ENT
button.
To resume the factory-set pin assignment, move the cursor to
STANDARD PARALLEL and press the ENT button. (For the
factory-set pin assignment, see page 1-34.)
The following display appears.

```
REMOTE CONTROL MENU


WARNING !!
HARDWARE CHANGE REQUIRED
PLEASE CONSULT MANUAL


PRESS ENT TO CONFIRM OR
ESC TO QUIT
```
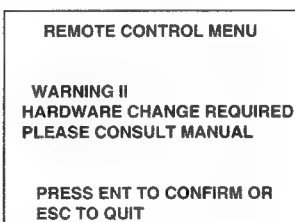
Hardware Change
When using STANDARD PARALLEL or CONFIGURE PARALLEL
mode, the 8-pin connector must be connected to HY-4 of the HY
board in the drawer. Although it must have been done at the factory,
make sure that the connector is connected to HY-4 properly. If not,
remove the connector from HY-2 and connect it to HY-4.

4 Press the ENT button again to confirm the mode change in step 3.
When STANDARD PARALLEL has been selected in step 3, the
selected mode is now activated and the monitor returns to normal
status.
When CONFIGURE PARALLEL has been selected, the CONFIG
PARALLEL REMOTE menu is displayed.

```
CONFIG PARALLEL REMOTE
■ PIN 1      MONO
  PIN 2      INPUT SEL 2/1
  PIN 4      SYNC
  PIN 5
  PIN 6      VITC
  PIN 7      MARKER MOVE
  SAVE AND APPLY
  PIN 3 TALLY   PIN 8 GND
  SELECT AND PRESS ENT
```
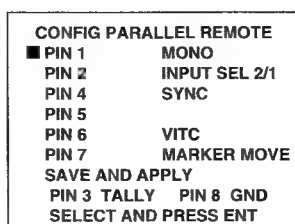
5 Move the cursor with the ⇩ button to the pin whose assignment is to be changed, then press the ENT button.
The following message appears.

```
CONFIG PARALLEL REMOTE


PLEASE SELECT FUNCTION
TO BE APPLIED TO PIN
AND PRESS ENT
```
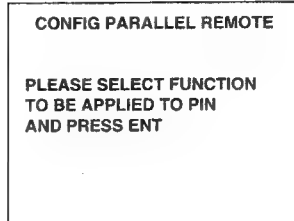
6 Press the button on the front panel or in the drawer (listed on page 1-35) whose function is to be assigned to the pin selected in step 5.

7 Press the ENT button.

Repeat steps 5, 6 and 7 for the other pins as desired.

8 When the pin assignment is completed, move the cursor to SAVE AND APPLY and press the ENT button.
The massage "DATA SAVED" is momentarily displayed, and the monitor returns to normal status.

9 Press the LOCAL/REMOTE button to set the monitor to the remote control mode.

To cancel the operation
Press the ESC button before pressing the ENT button in step 8.

Notes
• When the INPUT selector 2, 3 or 4 is assigned to one of the REMOTE connector pins through CONFIGURE PARALLEL, the input signal for the assigned INPUT selector is selected by short-circuiting the pin to GND. In open status, the input signal of the INPUT selector 1 is selected.
• When two or more INPUT selectors are assigned to the REMOTE connector pins, be sure not to simultaneously short-circuit these pins to GND.

1-4-7. Defining the Monitor Configuration

In MONITOR CONFIG menu operation, the following operating conditions of the monitor can be defined.

OPTION INSTALLATION: To specify the installed optional boards.
D1 CONFIGURATION: To specify the system in which D-1 signals are to be received.
COMPONENT OFFSET: To set the setup level for component signals
NTSC OFFSET: To set the setup level for NTSC signals.
MONITOR TYPE: To define the model of your monitor.

In addition, all the menu options you changed can be reset to the factory-set conditions using the **RESTORE FACTORY SETUP** option.

To start with the MONITOR CONFIG menu operation

1 Press the MENU button to display the initial menu.

2 Press the ⇩ button until the cursor reaches MONITOR CONFIG, then press the ENT button.
The MONITOR CONFIGURATION menu is displayed.

```
┌─────────────────────────────────┐
│   MONITOR CONFIGURATION          │
│                                  │
│ ■ OPTION INSTALLATION            │
│   D1 CONFIGURATION               │
│   COMPONENT OFFSET               │
│   NTSC OFFSET                    │
│   MONITOR TYPE                   │
│   RESTORE FACTORY SETUP          │
│                                  │
│   SELECT AND PRESS ENT           │
└─────────────────────────────────┘
```

To specify the installed optional boards

1 Set the cursor to OPTION INSTALLATION on the MONITOR
CONFIGURATION menu and press the ENT button.
The OPTION INSTALLATION menu 1 is displayed.

```
OPTION INSTALLATION 1
■ AUTO SETUP        YES
  D1 OPTION         YES
  D2 OPTION         YES
  NTSC DECODER      YES
  NTSC COMB ADP     YES
  PAL DECODER       YES
  PAL COMB ADP      YES
  OTHER OPTIONS
    SELECT AND PRESS ENT
```

2 By pressing the ⇩ button, move the cursor to the board for which
the YES/NO setting must be changed, and press the ENT button.
YES must be displayed for the installed board and NO for
uninstalled boards. Pressing the ENT button toggles the YES/NO
setting.

Repeat step 2 for the other boards as necessary.

3 Move the cursor to OTHER OPTIONS and press the ENT button.
The OPTION INSTALLATION menu 2 is displayed.

```
OPTION INSTALLATION 2
■ PAL-M DECODER     YES
  SECAM DECODER     YES
  RGB/COMP O/P      YES
  VITC BOARD        YES
  SAFE AREA         YES
  BLACK GENER       YES
  OTHER OPTIONS
    SAVE AND APPLY
    SELECT AND PRESS ENT
```

4 Set YES/NO for the boards listed in menu 2 in the same manner as
with menu 1.

5 When the YES/NO setting is completed, move the cursor to SAVE
AND APPLY and press the ENT button.
The message "DATA SAVED" is momentarily displayed and the
monitor returns to normal status.

To specify the system in which D-1 signals are to be received

Before starting the following procedure, set D1 OPTION of the above OPTION INSTALLATION menu 1 to YES.

1 Move the cursor with the ⇩ button to D1 CONFIGURATION on the MONITOR CONFIGURATION menu and press the ENT button.
The D1 CONFIGURATION menu is displayed.

```
         D1 CONFIGURATION

     ■ PAL        *
       NTSC
       SECAM

     SPECIFY SETTING OF LOCAL
     SWITCH ON BV BOARD

       SELECT AND PRESS ENT
```

The asterisk indicates the current setting.

2 Move the cursor with the ⇩ button to the system matching setting of the local switch on the BV board.

3 Press the ENT button.
The message "DATA SAVED" is momentarily displayed and the monitor returns to normal status.

To set the setup level for component signals

1 Move the cursor with the ⇩ button to COMPONENT OFFSET on the MONITOR CONFIGURAITON menu and press the ENT button.
The COMPONENT OFFSET menu is displayed.

```
         COMPONENT OFFSET

     ■ N-10            *
       BETACAM  0
       BETACAM  7.5

       SELECT AND PRESS ENT
```

The asterisk indicates the current setting.

2 Move the cursor with the ⇩ button to the appropriate setup level.
N-10: When supplying the 100/0/100/0 component signals.
BETACAM 0: When supplying the 100/0/75/0 component signals.
BETACAM 7.5: When supplying the 100/7.5/75/7.5 component signals.

3 Press the ENT button.
The message "DATA SAVED" is momentarily displayed and the
monitor returns to normal status.

To set the setup level of NTSC signals

1 Move the cursor with the ⇩ button to NTSC OFFSET on the
MONITOR CONFIGURATION menu and press the ENT button.
The NTSC OFFSET menu is displayed.
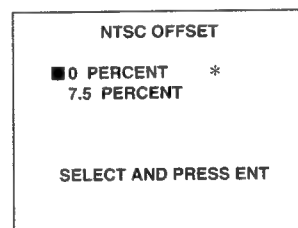
```
┌─────────────────────────────┐
│        NTSC OFFSET          │
│                             │
│  ■0 PERCENT      *          │
│   7.5 PERCENT               │
│                             │
│                             │
│   SELECT AND PRESS ENT      │
│                             │
└─────────────────────────────┘
```

The asterisk indicates the current setting.

2 Move the cursor with the ⇩ button to the appropriate setup level.
0 PERCENT: When supplying 0 IRE NTSC signals.
7.5 PERCENT: When supplying the 7.5 IRE NTSC signals.

3 Press the ENT button.
The message "DATA SAVED" is momentarily displayed and the
monitor returns to normal status.

To define the model of your monitor

1 Move the cursor with the ⇩ button to MONITOR TYPE on the
MONITOR CONFIGURATION menu and press the ENT button.
The MONITOR TYPE menu is displayed.

```
┌─────────────────────────────┐
│        MONITOR TYPE         │
│                             │
│  ■BVM-1311/1411             │
│   BVM-1911/2011    *        │
│   BVM-1316/1416             │
│   BVM-1916/2016             │
│                             │
│   SELECT AND PRESS ENT      │
│                             │
└─────────────────────────────┘
```
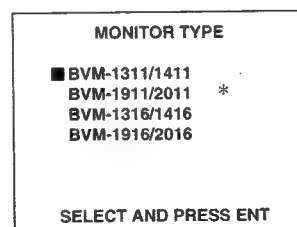
The asterisk indicates the current setting.

2 Move the cursor with the ⇩ button to the model name of your
monitor.

3 Press the ENT button.
The message "DATA SAVED" is momentarily displayed and the
monitor return to normal status.

To restore the factory setup

1 Move the cursor with the ⇩ button to RESTORE FACTORY
SETUP in the MONITOR CONFIGURAITION menu and press
the ENT button.
The following message is displayed.

```
RESTORE FACTORY SETUP


WARNING II
THIS WILL DESTROY ALL
MANUALLY ENTERD DATA
AND CONFIGURATIONS

PRESS ENT TO CONFIRM
OR ESC TO QUIT
```

2 Press the ENT button.
All the changed menu options returns to the factory-set conditions.

To cancel the restoration, press the ESC button before pressing the
ENT button in step 2.

1-5. Convergence Adjustments

For the convergence adjustment, use the CONVERGENCE controls on the DC board inside the drawer. Use the supplied screwdriver to turn these controls.

1-5-1. Convergence of a 4:3-Aspect Normal Picture

Adjust the convergence of 4:3 scan mode using the 4:3 controls.
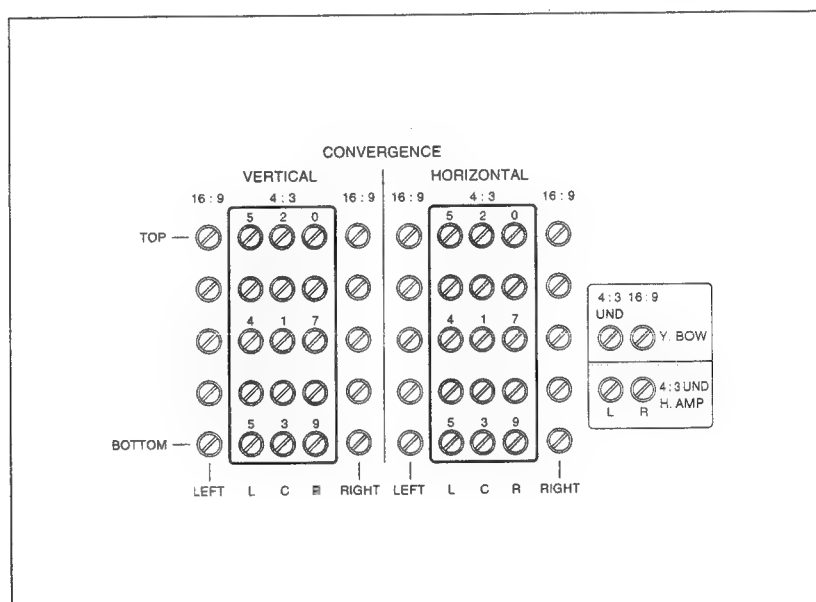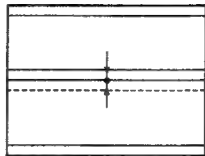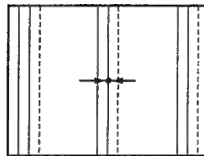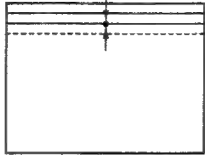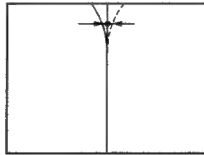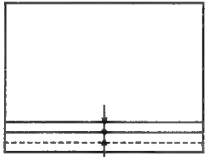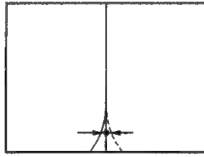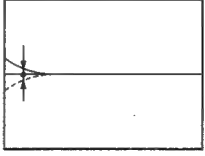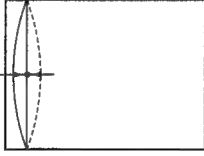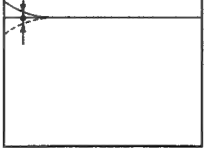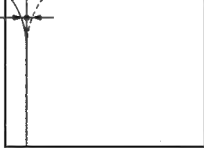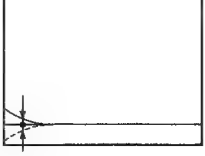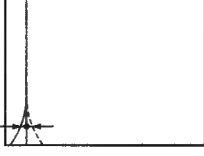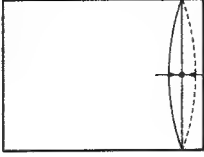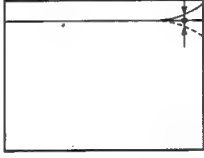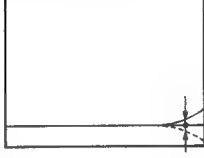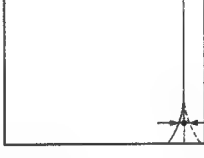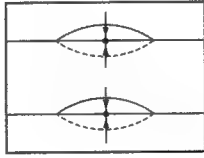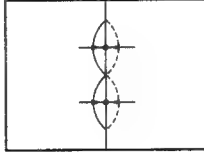
DC board

- Numbers 1 to 9 in the illustration above refer to the sequence of operations.
- The HORIZONTAL controls adjust the convergence horizontally, and the VERTICAL controls adjust it vertically.
- When adjusting the convergence, observe the portion of the screen indicated by arrows in the figures on the subsequent pages. The red and blue beams move symmetrically to the green beam.

Adjust the convergence at the corresponding portion of the screen, as follows.

VERTICAL	HORIZONTAL
1 At center	
2 At center top	
3 At center bottom	
4 At left center	
5 At top left	
6 At bottom left	

VERTICAL	HORIZONTAL
7 At right center	
8 At top right	
9 At bottom right	
10 Adjust the convergence between the center and top and between the center and bottom on the screen as required.	

1-5-2. Convergence of a 4:3-Aspect Underscanned Picture

Adjust the convergence of 4:3 underscan mode using the 4:3 UND H. AMP and 4:3 UND Y. BOW controls after the convergence adjustment of normal scan mode is completed.
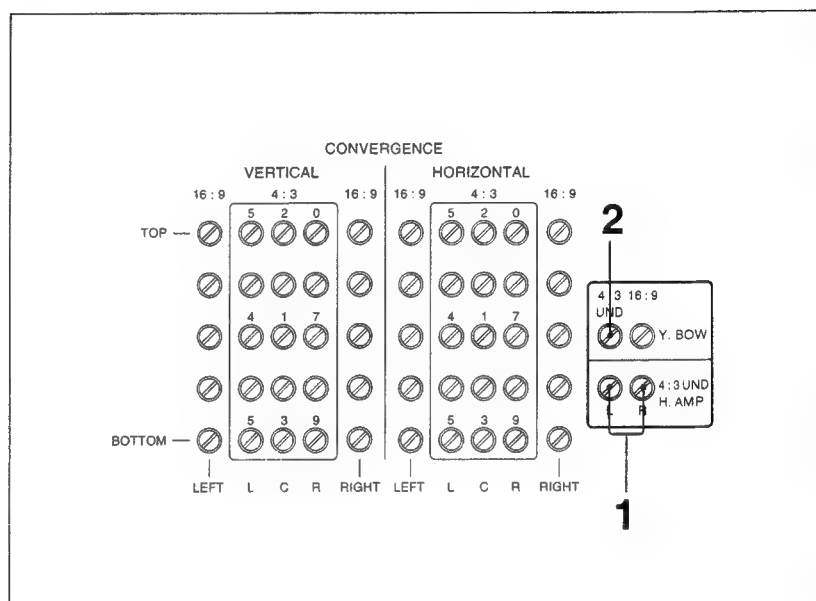
1 Adjust the horizontal convergence with the 4:3 UND. H. AMP controls.

L (left)   R (right)
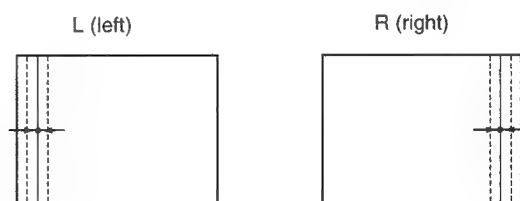
2 Adjust the horizontal convergence at the corners of the picture with the 4:3 UND. Y. BOW control.
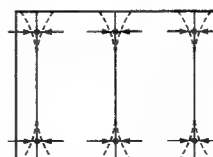
1-5-3. Convergence of a 16:9-Aspect Picture

Adjust the convergence of 16:9 scan mode.
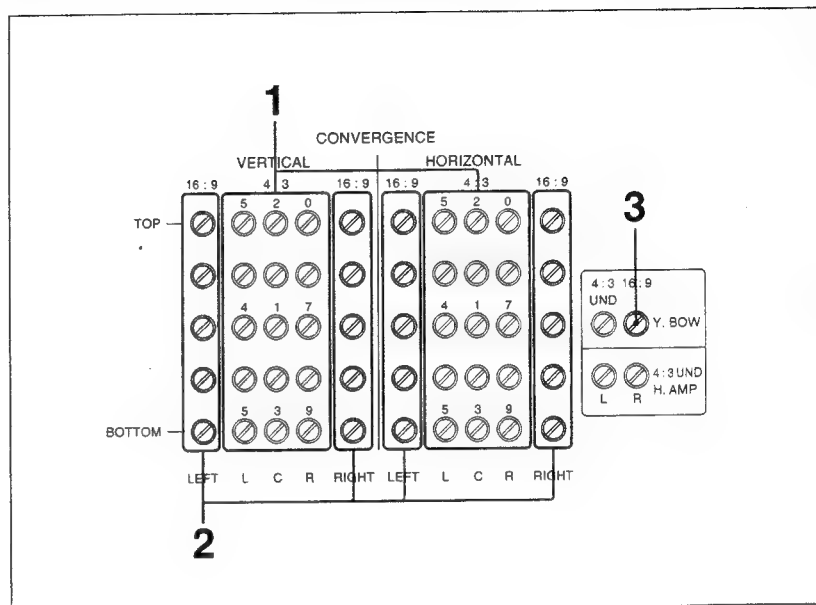
1 Adjust the convergence at the center of the screen following the procedure mentioned in "1-5-1. Convergence of a 4:3-aspect normal picture."

2 Adjust the convergence at the right and left portions of the screen using the 16:9 controls.

3 Adjust the horizontal convergence at the corners using the 16:9 Y. BOW control.

1-6. Picture Adjustments

1-6-1. White Balance Adjustment

During the adjustment, turn the red green and blue beams on and off
with the SCREEN switches on the front panel as required.
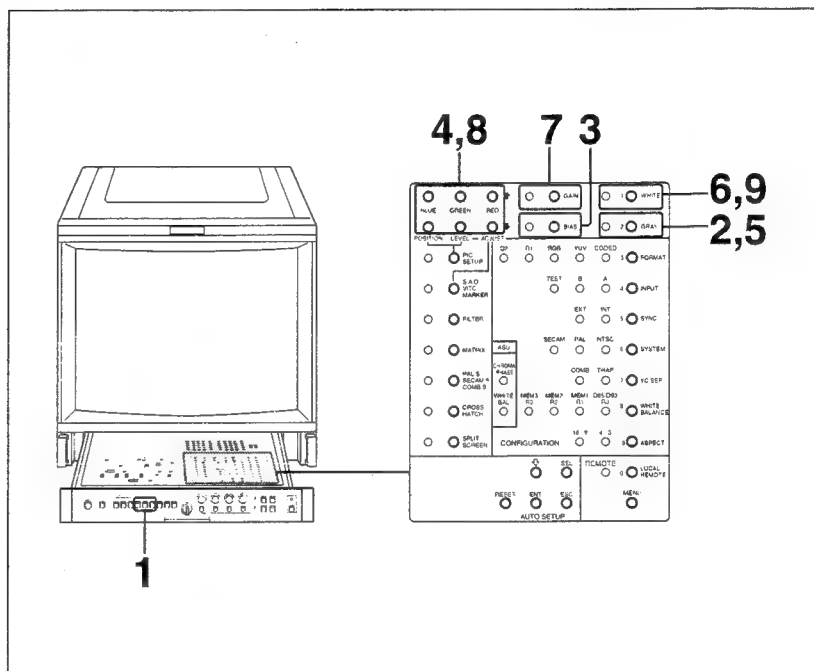
1 Display a test signal on the screen.

2 Press the GRAY button.
The associated lamp lights and the internal gray signal is displayed
on the screen.

3 Press the BIAS button.
The associated lamp lights.

4 Adjust the white balance at the lowlight by pressing the BLUE,
GREEN and RED buttons ↑ or ↓.

5 Press the GRAY button again.
The associated lamp goes off and the internal gray signal
disappears.

6 Press the WHITE button.
The associated lamp lights and the internal 100% white signal is
displayed on the screen

7 Press the GAIN button.
The associated lamp lights.

8 Adjust the white balance at the highlight by pressing the BLUE, GREEN and RED buttons ↑ or ↓.

9 When the adjustment is completed, press the WHITE button so that the lamp goes off and the white signal disappears.

For white balance adjustment using a color analyzer or equivalent, see Section 2.

1-6-2. Black Level Adjustment

Match the black reference of the monitor with the black level of the input signal to be monitored.
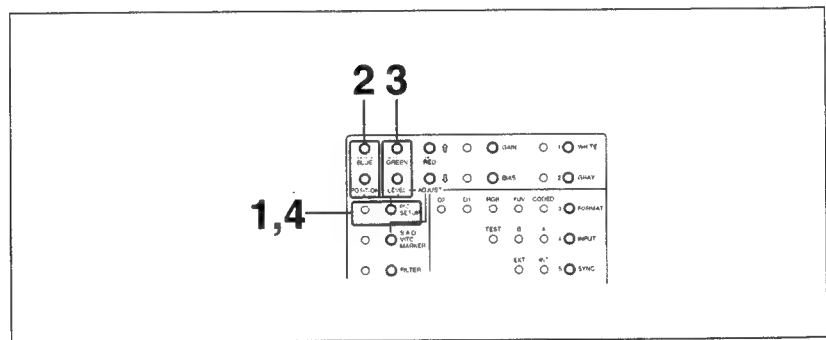
1 Press the PIC SETUP button.
The associated lamp lights and a vertical picture band and the black reference of the monitor are displayed on the screen.

Input signal checking zone

Black reference of the monitor
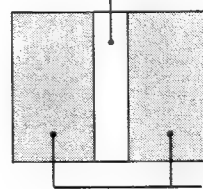
2 Press the POSITION buttons ↑ or ↓ to move the position of the picture band horizontally so that the black signal of the picture is located next to the black reference area.

3 Press the LEVEL buttons ↑ or ↓ to match the brightness of the black reference area with that of the input black signal.

4 Press the PIC SETUP button again.

Section 1 Operation

1-7. Specifications

General

System	BVM-1911: 525 lines per picture, 60 fields per second interlaced, NTSC
	BVM-2011P: 625 lines per picture, 50 fields per second interlaced, PAL
CRT	Super Fine Pitch Trinitron 0.3 mm aperture grille, 90-degree deflection, 36 mm dia. in-line gun
	Effective picture size:
	291 × 384 mm (h/w) ($11^1/2$ × $15^1/8$ inches)
	482 mm (19 inch) picture measured diagonally
Picture tube protection	EHT (Extremely High Tension) is shut off in the event of scan failure.
Warm up	30 minutes to meet specifications
Anode voltage	Properly adjusted HV 27 kV at zero beam current
Power consumption	Typical: 145 W
	Maximum: 185 W
Power requirements	BVM-1911: 100-120 V AC ±10%, 50/60 Hz
	BVM-2011P: 220-240 V AC ±10%, 50/60 Hz
Dimensions	448 × 455 × 584 mm (w/h/d)
	(17 $^3/4$ × 18 × 23 inches)
	including projecting parts and controls
Mass	43 kg (94 lb 13 oz)

Inputs/outputs

Video inputs	BNC type (5 inputs with 5 loop-through outputs)
	VIDEO A/B, TEST, R/G/B:
	0.714 Vp-p noncomposite or 1 Vp-p composite ±6 dB positive, high-impedance
	Y: Composite, 1.0 Vp-p ±6 dB, high-impedance
	R-Y/B-Y: 0.7 Vp-p ±6 dB, high-impedance
Sync input	EXT SYNC: BNC type (1 input with 1 loop-through output)
	1 to 8 Vp-p negative, high-impedance
Input return loss	More than 46 dB (7 MHz with 75-ohm termination)
Hum rejection	Reduced by more than 50 dB
	Maximum hum: Less than 4 Vrms, where hum is applied to the monitor in floating ground mode

Video outputs	DECODER OUT: BNC type (3)
	Output decoded signals only when BKM-1440 is installed.
Remote control	REMOTE: 10-pin connector (1)
Probe receptacle	AUTO SETUP PROBE: 12-pin connector (1)

Video signal

Luminance channel (RGB and composite signals)

Differential gain	Within 2% for a luminance from 0 to 103 cd/m^2
Differential phase	Within 2° for a luminance from 0 to 103 cd/m^2
Frequency response	Monochrome mode: 100 Hz to 8 MHz ±1 dB (aperture correction at 0)
	Color mode: Trap or comb filter removes frequency in 3.58 MHz region (BVM-1911) or 4.43 MHz (BVM-2011P) region
	RGB mode: 100 Hz to 10 MHz ±1 dB

Chrominance channel

Demodulation axis	R-Y, B-Y
Bandpass	1.3 MHz equiband
Subcarrier regeneration	
	±1° (standard input signal)
Phase control range	More than ±15° (standard input signal)
Chroma gain control range	
	More than ±6 dB

Chrominance/luminance

Time error	Less than 30 nsec
Gain error	Less than 5%
Aperture correction	Adjustable continuously up to 6 dB boost at 4.5 MHz or 6.5 MHz (selectable)

DC restoration (RGB and composite signals)

Back porch type
Back porch level: Within 1% of peak luminance, 10% to 90% (average picture level)

Synchronization

AFC time constant	0.5 msec (fast), 2 msec (normal) or 7 msec (slow)
Line pull range/line hold range	
	More than ±500 Hz at 0.5 msec time constant
Vertical blanking time	Normal: Within 1 msec.
	Underscan: Within 0.8 msec.
Horizontal retrace time	Within 10 μsec

Picture performance

Normal scan   5% overscan of CRT effective screen area (adjustable range more than ±15%)

Underscan   3% underscan of CRT effective screen area (adjustable range more than ±15%)

Linearity   Within a central area bounded by a circle whose diameter equals the picture height, within 0.5% of the picture height, out of area 1%

Color temperature   D6500, adjustable to other color temperatures

Nominal chromaticity coordinates

BVM-1911: SMPTE C phosphor

	x	y
Red	0.630	0.340
Green	0.310	0.595
Blue	0.155	0.070

BVM-2011P: EBU standard phosphor

	x	y
Red	0.64	0.33
Green	0.29	0.60
Blue	0.15	0.06

Error: Less than ±0.005

Convergence error   Central area: Less than 0.4 mm
Periphery: Less than 0.7 mm

Calibrated constant   103 cd/m^2 at peak white of standard 1 Vp-p signal

Raster size stability   Less than 1% picture height, 0% to 100% APL at 103 cd/m^2 peak luminance

Scan delay   Horizontal: Approx. $^1/_4$ line
Vertical: Approx. $^1/_2$ field

Resolution   More than 900 TV lines (center, at 103 cd/m^2 luminance)

Environment

Operating temperature   0° C to 40° C (32° F to 104° F)

Optimum temperature range
    20° C to 30° C (68° F to 86° F)

Humidity   0 to 90%

Altitude   Approx. 3,050 m (10,000 feet) max.

Supplied accessories
AC power cord (1)
Cord stopper (1)
Screwdriver (1)
Drawer keys (2)
Extension board (1)
10-pin connector (1)
Fuses (2)
Tally number plates (1 set)
Operation and maintenance manual (1)

Design and specifications are subject to change without notice.

(2)

SECTION 2
DISASSEMBLY

2-1. COVER REMOVAL

② Two screws (B4×6)

① Two screws (B4×6)

⑦ Two screws (B4×6)

③ Top cover

⑧ Two screws (B4×6)

④ Two screws (B4×6)

⑨ Cover (Left)

⑥ Cover (Right)

⑤ Two screws (B4×6)

2-2. BEZEL ASSEMBLY REMOVAL

⑪ Pull out the connector (2P)

② Two screws (B4×6)

③ Handle assembly (Left)

⑦ Two screws (B4×6)

⑧ Two screws (B4×6)

⑥ Handle assembly (Right)

⑨ Two screws (B4×6)

⑤ Two screws (B4×6)

④ One screw (K3×8)

⑩ Bezel assembly

① Pull out the drawer assembly
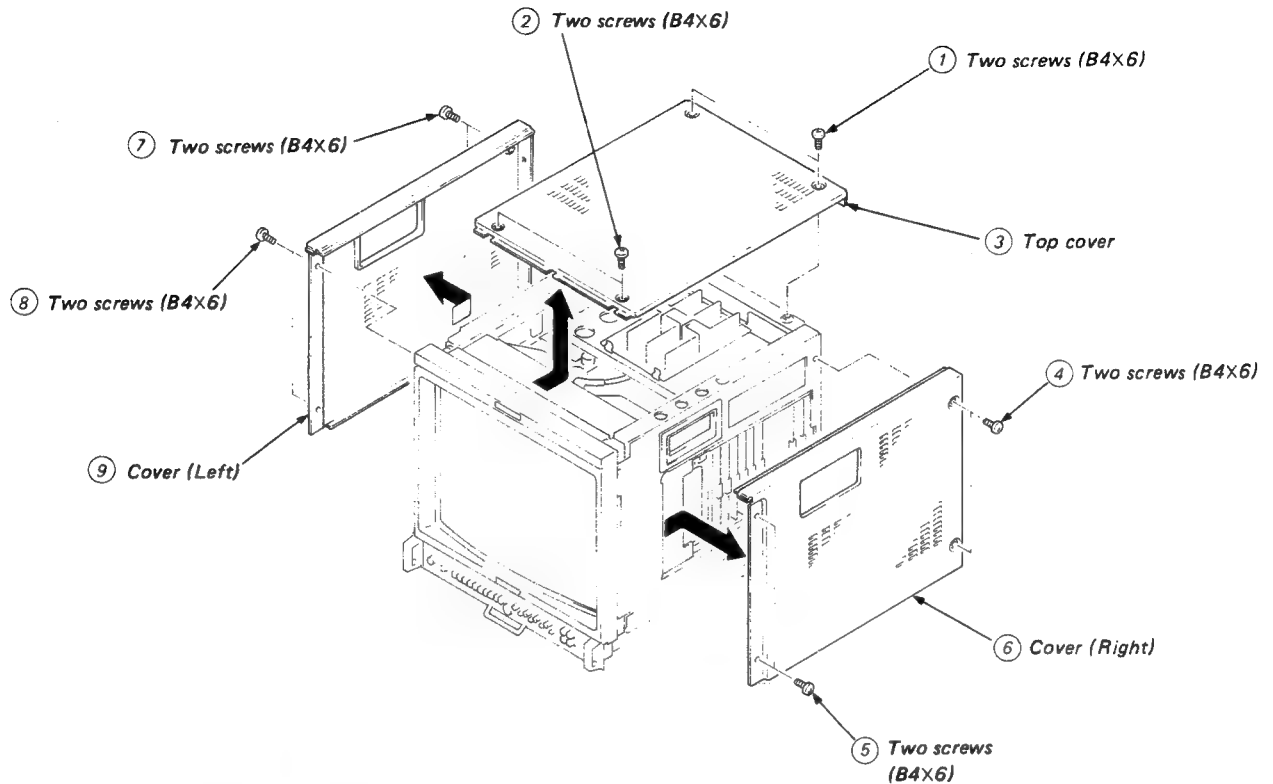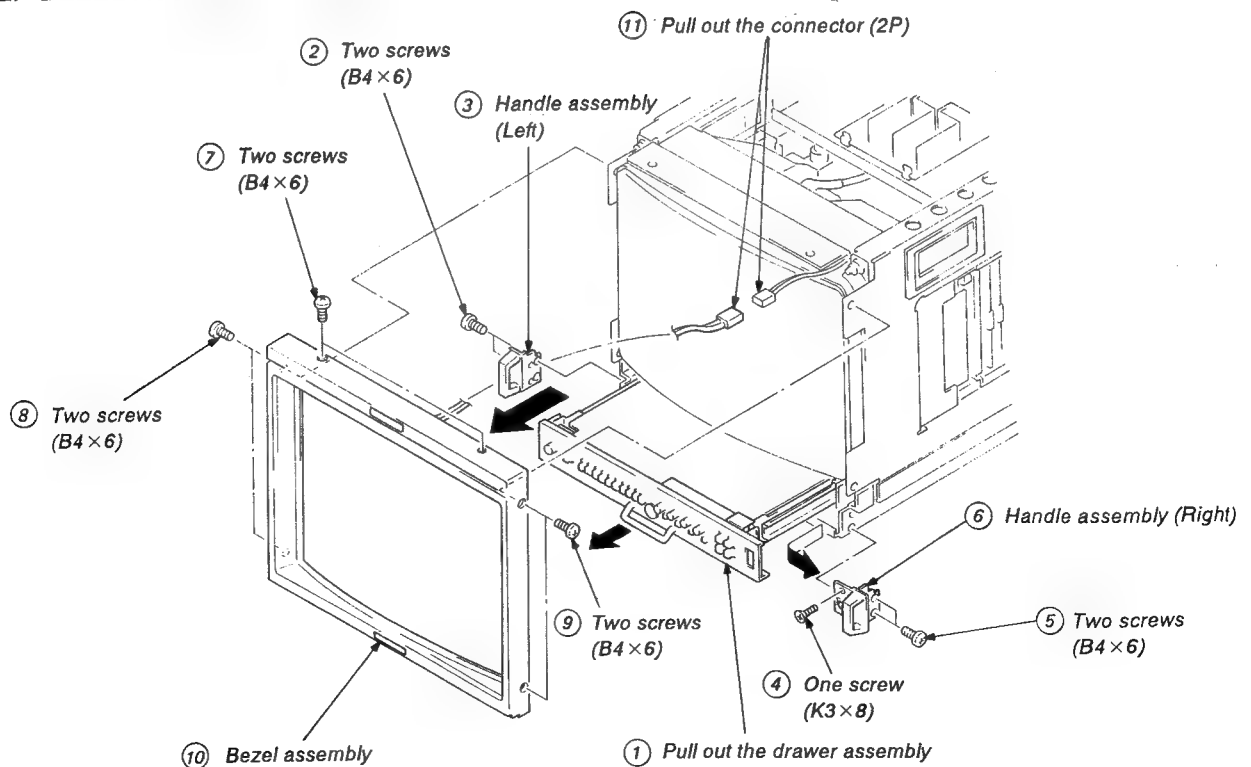
2-3. CHECK OF C BOARD

Note: Do it after removing cover (Right, Left).
(Refer to 2-1. COVER REMOVAL)

⑥ C board

⑤ Rear cover

① Two screws (B4×8)

④ One screw (B4×8)

③ Two screws (B4×8)

② Two screws (B4×8)
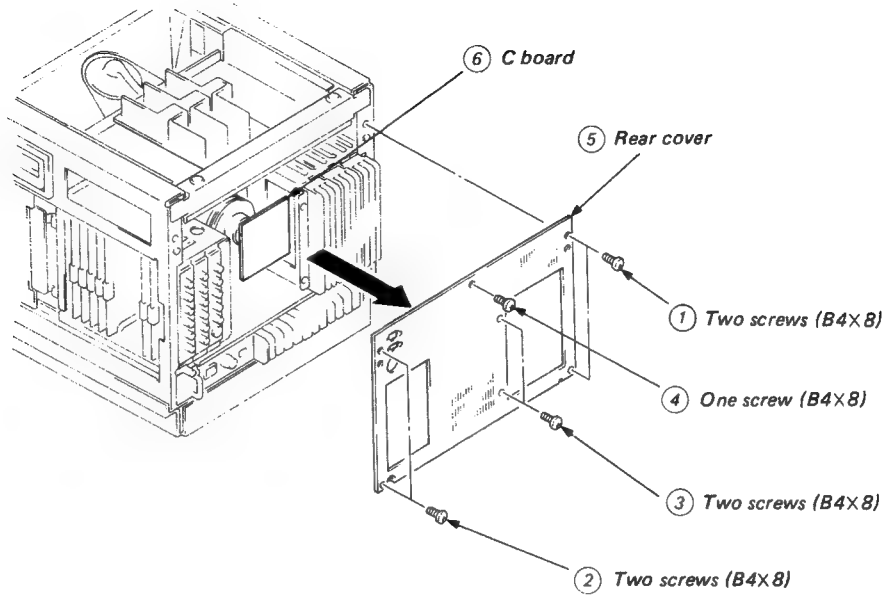
2-4. QA, QB, W AND V BOARDS REMOVAL

Note: Do it after removing rear cover. (Refer to 2-3. CHECK OF C BOARD)

⑦ Remove two connectors (TB-4 (black), TB-5 (white) both 2P) from the TB board.

⑥ Pull out all boards from BA, B1 to B5 slots, bend three wire holders on the TB board in the direction of arrow and remove harness.

③ Bend wire holder and remove harness.

To W board

② Remove three connectors (BA-4 (red), BA-5 (yellow), BA-6 (white) all 2P) from the BA board.

To QB board

To V board

To QA board

④ Remove three connectors (BA-1 (white), BA-2 (red), BA-3 (black) all 2P) from the BA board.

① BA board

⑧ Remove connector (TB-6 (white) 8P) from the TB board.

⑤ Bent wire holder and remove harness.

⑭ W board

⑬ Two screws (BVTT3×6)

⑮ V board

⑩ QA board

⑨ Two screws (BVTT3×6)

⑪ Two screws (BVTT3×6)

⑫ QB board

2-2

2-5. OPEN THE BK BLOCK

② BK block

① Two screws (B4×8)

Rear side view

③ Insert end of the BK block chassis to the main chassis.

2-6. BK BOARD REMOVAL

② Bend five wire holders on the BK board in the direction of arrow and remove harness.

③ Remove five connectors (BK-1 (red), BK-2 (yellow), BK-3 (white) all 4P, BK-4 (white) 3P, BK-5 (white) 5P) from the BK board.

⑦ BK board

To signal block

① Remove three connectors (BK-6 (red), BK-7 (yellow), BK-8 (white) all 4P) from the BK board.

④ Loosen a screw (BVTT 3×6) and remove ground terminal.

⑤ Loosen a screw (BVTT 3×6) and remove ground terminal.

⑥ Remove 2 claws of PCB holder in the direction of arrow.

2-7. CHECK OF BK BOARD

② Open the BK board as showen by arrow.

③ Stand the BK board on two support spacers.

① Two PCB holders

2-8. CHECK OF DB BOARD

① Two screws (B3×10)

② DB board

2-9. CHECK OF PA BOARD

Note: EA and EB boards can be checked similarly.

EA board

EB board

④ Insert the PA board to connector of the Z board.

② PA board

TA board

① Two screws (B3×16)

③ Insert the Z board of Accessory assembly to connector of the TA board.

2-10. CHECK OF BJ BOARD

Note: PC board retainer is attach as anti-detach jig for the board. Remove the PC board retainer before checking.

Note: BA, BC, BG, BH, BI and BT boards can be checked similarly.

BI board   BH board   BG board

BC board

BT board

BA board

TB board

② Insert the BJ board to connector of the Z board.

① Insert Z board of Accessory assembly to connector of the TB board.

2-11. GC BOARD REMOVAL

② PC board retainer

① Two screws
(B3×10)

⑦ Remove three connectors
(GC-3 (white), GC-2 (yellow),
GC-1 (red) all 5P) from the GC
board.

④ Slide the signal block to claw
on the chassis and remove in
the direction of arrow.

③ Two screws
(B3×10)

Signal block

⑤ Two screws
(B3×10)

⑥ GC board

2-12. POWER BLOCK ASSEMBLY REMOVAL

③ Four connectors (2P, 4P, 6P, 12P)

② Power block

① Two screws (B4×8)
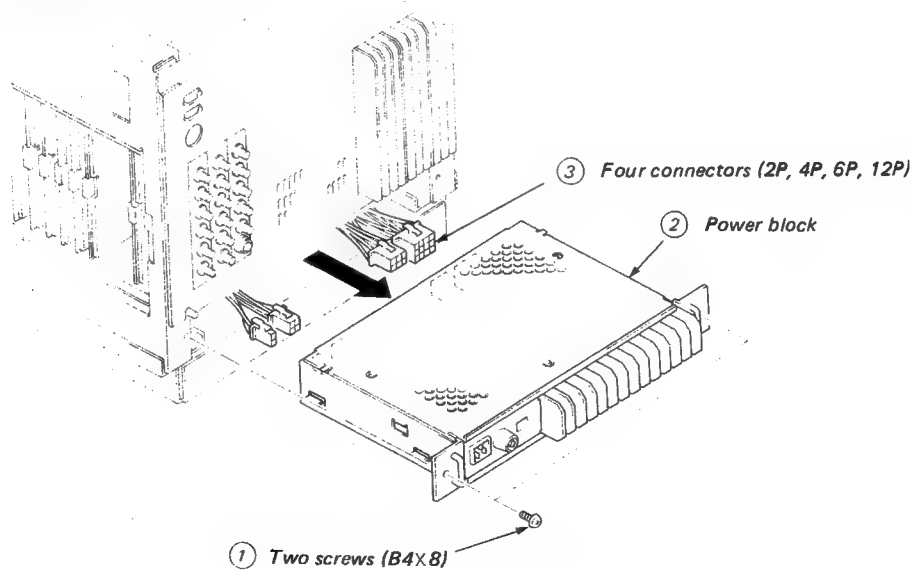
2-13. FLYBACK TRANSFORMER AND HIGH VOLTAGE BLOCK REMOVAL

⑦ Two screws (B3×10)

⑥ Remove the HV bracket as shown by arrow.

⑧ HVR assembly

⑩ High voltage block (D.C.T)

● REMOVAL OF ANODE CAP

anode cap remover (3-702-436-01)

①

anode cap

③

②

Be sure to short-circuit the anode of picture tube and the anode cap to ground after removing the anode cap.

⑨ Three screws (B3×10)

③ Anode cap

⑫ Flyback transformer assembly

⑪ Three screws (B3×10)

⑬ PB board

⑤ One screw (B4×8)

④ One screw (B4×8)

① Remove three connectors (TA-8 (white) 8P, TA-9 white) 6P, TA-11 (yellow) 6P) from the TA board.

② Disconnect connector (PA-1 (white) 3P) from the PA board.

2-13-1. REMOVAL AND REPLACEMENT OF HIGH VOLTAGE CABLE

<Removal>

High voltage block

① Slide the cover.

② Push in the cable.

③ Rotate 90° in the direction of arrow.

④ Pull out the cable.

<Installation>

gutter

claws

① It will be locked by inserting it so as to put claw of HV-cable into groove as shown in the figure.

② Install the cover.
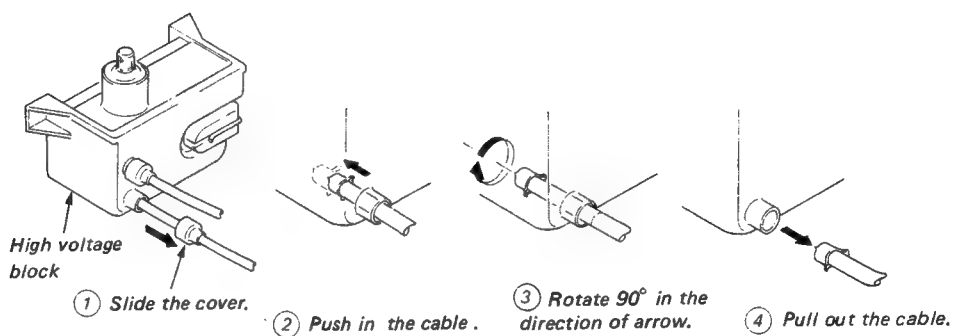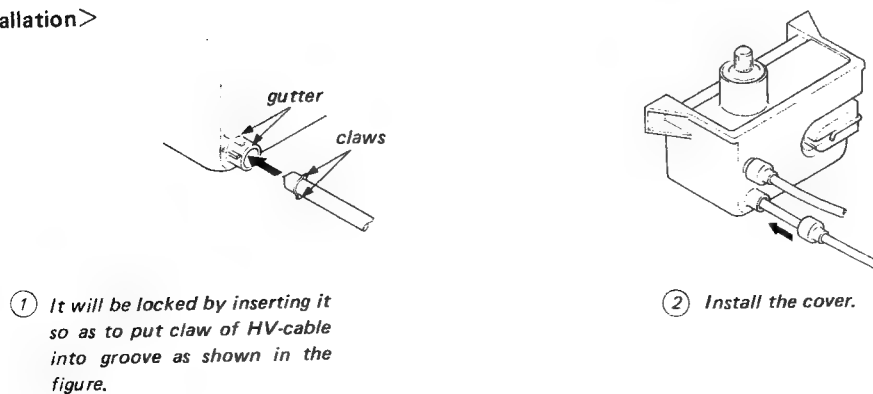
2-14. PICTURE TUBE REMOVAL

② C board

① Anode cap
(Refer to 2-13. REMOVAL ANODE CAP)

⑨ Two CRT position washers

⑥ Two flange nuts

③ Neck assembly

④ Neck assembly (362)

⑩ Picture tube

⑤ Deflection yoke

⑧ Two CRT position washers

⑦ Two flange nuts
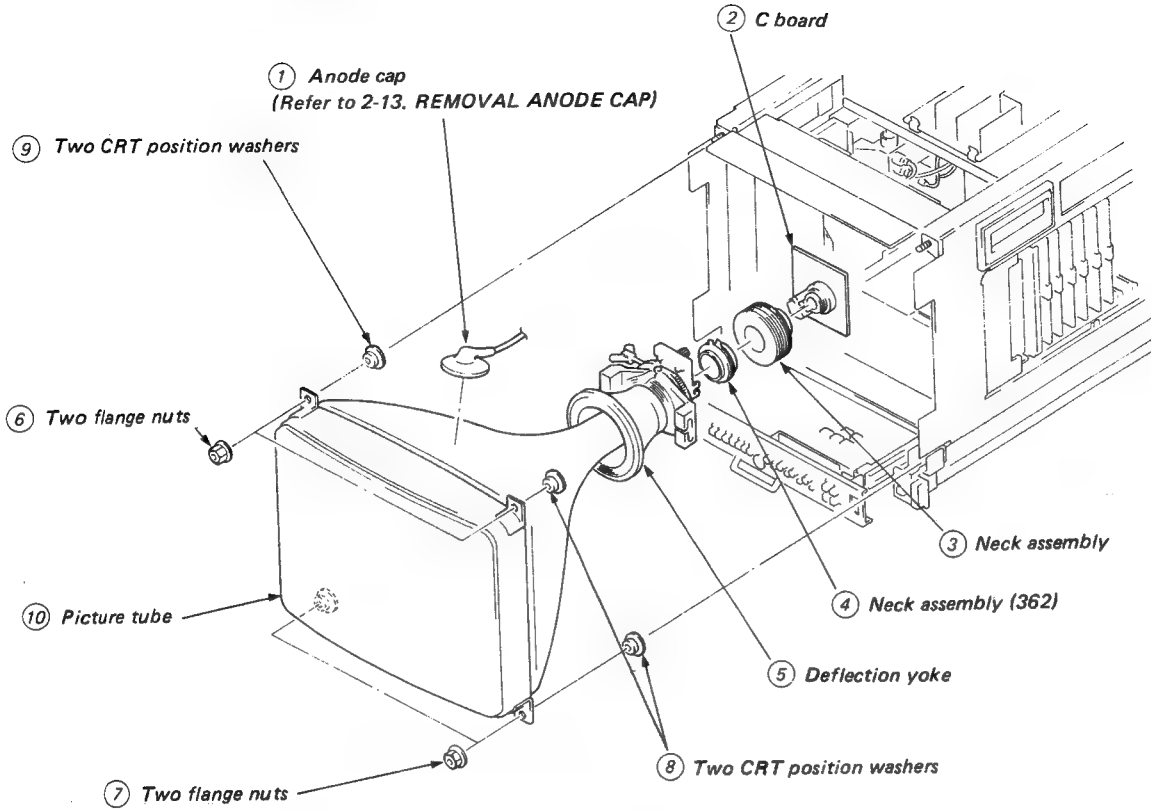
2-15. CONTROL PANEL ASSEMBLY REMOVAL

② Six screws
(B3×8)

③ Remove the
PC board cover.

① Pull out the drawer block

④ Three screws
(BVTT3×6)

⑥ HY board

⑨ Two screws
(B3×6)

⑤ Remove the stand off-brake
band guide.

⑦ Remove three connectors
(HZ-5 (WHT), 6P
HZ-6 (WHT), 12P
HZ-7 (RED), 12P
from the HZ board)

⑩ Two screws
(B3×6)

⑪ Control panel assembly

⑧ Two screws
(B3×6)

2-8
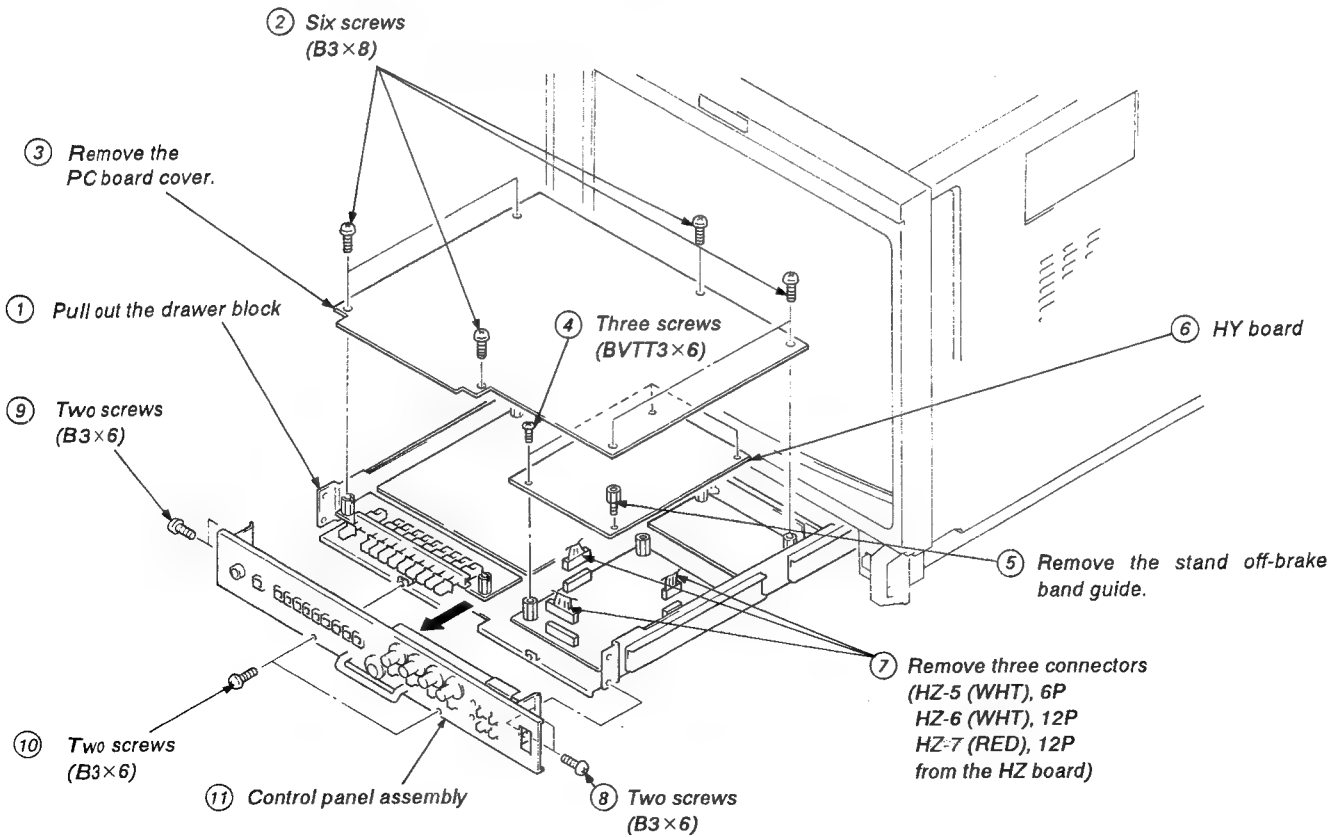
SECTION 3
CIRCUIT DESCRIPTIONS

3-1. QA, QB, BA BOARDS

3-1-1. Input Circuit

Cable Compensation (QA, QB)

CABLE COMPENSATION is composed of inductance L and capacitor C1 (Figure 1) in QA board and performs return loss compensation.

Grounding or floating in input terminal can be selected by switch S1.

On floating mode, common mode rejection can be performed. QB board also has same function.
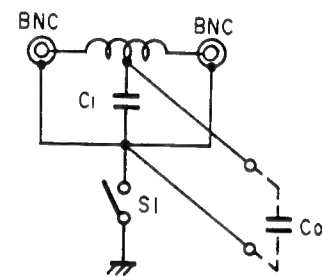
Figure 1

Hook Up Circuit (BA)

This circuit is composed of transistors Q101-105 and performs common mode rejection when SW S1 is selected to the floating mode.

In Figure 2, Gains of amplifier for input A and B are derived as follows.

$$A = \frac{Rc}{Ri} : \text{Gain of amplifier for input A}$$

$$B = -\frac{Rc}{Ri} : \text{Gain of amplifier for input B}$$

When input (ec + ei) is applied to input A and input (ec – ei) to input B, then output eo is

$$eo = \frac{Rc}{Ri}(ec + ei) + (-\frac{Rc}{Ri})(ec - ei) = 2\frac{Rc}{Ri}ei$$

This equation indicates that ec is eliminated and there is no common mode signal in output signal.

On hook up circuit, NF Amplifier (Negative Feedback) is used to get frequency response flat.
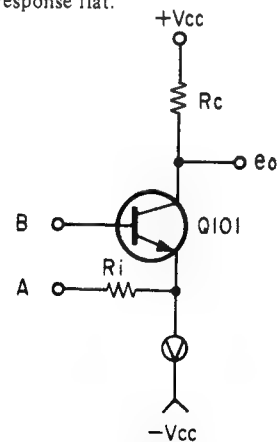
Figure 2

Input Select Sw, Sync Select SW (BA)

For composite video signal, VIDEO A/B/TEST mode is selected by INPUT SELECT SW (IC1). For sync signal, INT SYNC/EXT SYNC is selected by SYNC SELECT SW IC2.

3-1-2. Sync AGC Circuit

This circuit is composed of following components; LPF (Low Pass Filter) (Q701), variable gain amplifier (Q702-Q705), bias control circuit (Q708-Q710), gain control circuit (Q711, 712) and amplifier (Q706, 707), Figure 3 shows block diagram of this circuit.

An inverted composite video signal or composite sync signal (eo) is derived at the collector of transistor Q707.

The bias control circuit compares maximum value of eo with base voltage of Q708 (E1) and controls bias of amplifier so that they match.

Also the gain control circuit compares pedestal level of eo with base voltage of Q711 (E2), and controls variable gain amplifier so that they match.
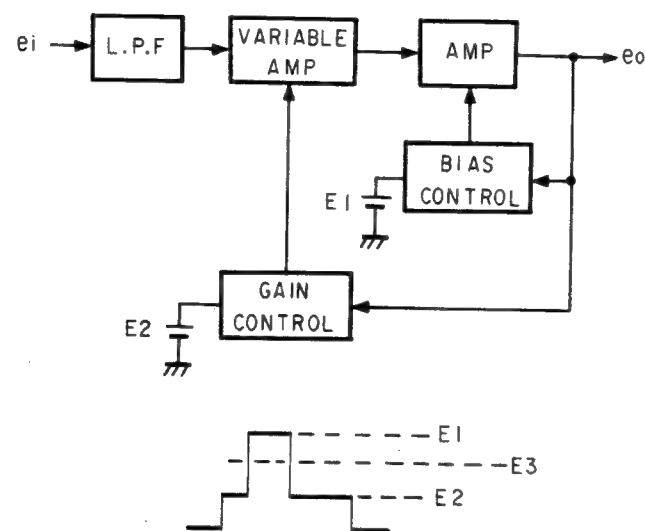
Figure 3

Composite Sync Separation, Vertical Sync Separation

Composite sync is separated from composite video signal or composite sync by comparing voltage eo with the base voltage of transistor Q713 (E3).

Horizontal component in composite video signal or composite sync signal is removed by LPF (Low Pass Filter, Q716) and Vertical sync is separated by transistor Q717.

BLOCK DIAGRAM OF QA, QB, BA BOARDS
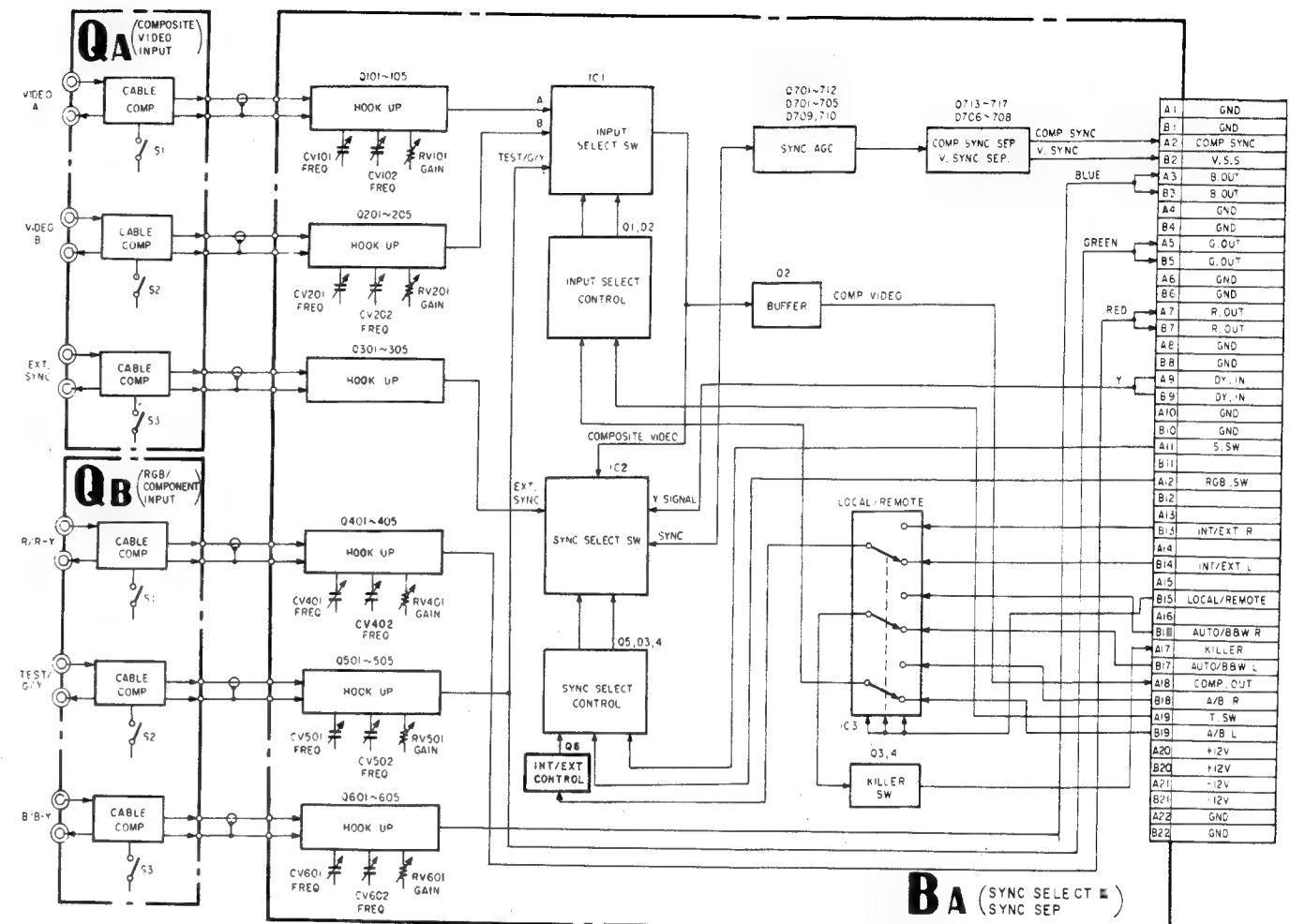
3-2. BG BOARD

3-2-1. Luminance Signal Circuit

Filter SW

IC1 works as a selector switch of composite video signal or luminance signal derived from Y/C separation circuit. This IC activates by either FILTER-SW in right side drawer or killer signal.

Aperture Control

Aperture control circuit is composed of DL1 (delay line), transistors Q5, 7, 8 and IC2. IC2 operates as a variable resistor. Resistance value between Pin ① and ③ is controlled by the potential between pin ③ and pin ④, also pin ① and pin ⑥.

Input signal: e_{T0},
Delayed signal by delay line: e_{T1}
Second delayed signal: e_{T2}

See Figure 4
e_1 (at base of transistor Q5) is obtained as below due to the combination of direct wave and reflected wave by DL1.

Figure 4

$$e_1 = (e_{T0} + e_{T2})/2$$
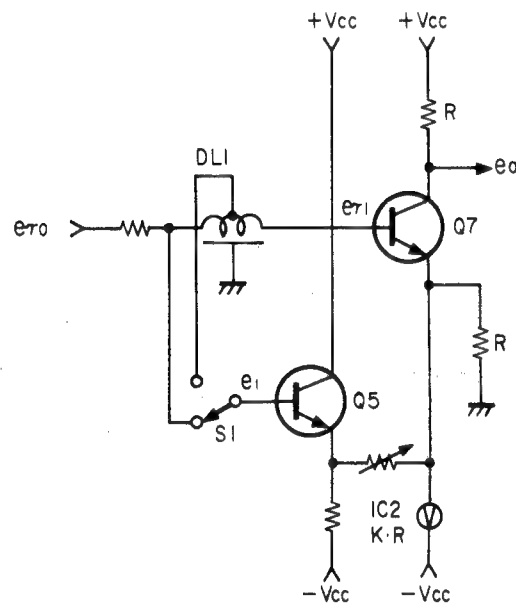
Therefore eo is

$$eo = -(e_{T1} + \frac{1}{K}(e_{T1} - \frac{1}{2}(e_{T0} + e_{T2})))$$

　　　 1st term 　　　 2nd term

K: variable constant

In the above equation, 1st term shows waveform A in Figure 5 and 2nd term shows waveform B. When K is variable, amount of pre-shoot and overshoot can be varied.
Switch S1 is used for selection of boost frequency.
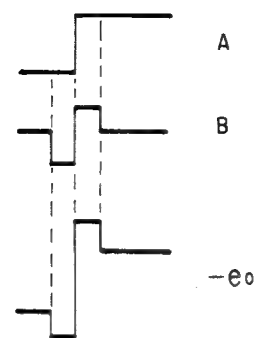
Figure 5

Y Delay, Y Buffer Amplifier

Y/C delay time can be matched by delay line DL2 and Y signal is amplified and fed to the next stage.

3-2-2. Color Gain Control Circuit

In this section (R-Y) signal processing is described as below, but (B-Y) signal is processed by the same way as (R-Y) signal.

R-Y Amplifier and Clamping

The R-Y color difference signal from the decoder board is amplified at the amplifier composed of transistors Q21 and Q22 and clamped at the Horizontal Sync by transistors Q23, Q24 and IC3.

R-Y Gain Control Amplifier

This is a variable gain control amplifier composed of variable resistor element of IC4 and transistors Q25-Q27. Gain of this amplifier can be controlled by the color gain control voltage at the pin ⑫ of IC4.

AGC Pulse Generator

Generates the reference pulse for AGC (Automatic Gain Control) of color gain control circuit.

Gain Control Amplifier for AGC Pulse

Circuit is the same as R-Y GAIN CONTROL AMPLIFIER. Gain of this amplifier is controlled by the voltage at pin ⑧ of IC4.

Color Gain Control

AGC pulse, which is output signal of Gain control amplifier for AGC pulse, is clamped by IC6 (2/3) and is made sampling by IC6 (3/3). Amplitude of AGC pulse and DC voltage supplied from CHROMA control on the front panel are compared and matched by IC7 (1/2) with controlling the above gain control amplifier.
This control voltage is supplied to the control terminals of R-Y and B-Y gain control amplifiers and controls color gain.

3-2-3. G-Y MATRIX amplifier

G-Y signal is obtained by matrixing R-Y signal and B-Y signal with the amplifier composed of transistors Q44 and Q45.

3-2-4. NTSC MATRIX SW

NTSC MATRIX mode operation is obtained by the matrix circuit composed of resistor networks CP14-CP19, transistor Q29, Q30, Q39, Q40, Q49, Q50 and IC5. CP14-CP19 perform matrixing and IC5 works as a switch.

3-2-5. Vector Output Circuit

R-Y Vector Output Gain Switcher

Vector output levels are compensated for each color standards, NTSC, PAL and SECAM.

R-Y Vector Output Amplifier and Clamping

Vector output signal is amplified by IC9 (2/2) and transistor Q54 and clamped by IC8 and transistor Q55 for the suitable operation.

3-2-6. COMPONENT R-Y Amplifier and Delay Circuit

R-Y signal of COMPONENT signal is compensated with amplitude, porality and delay time to match the R-Y signal of decoder output.

BLOCK DIAGRAM OF BG BOARD
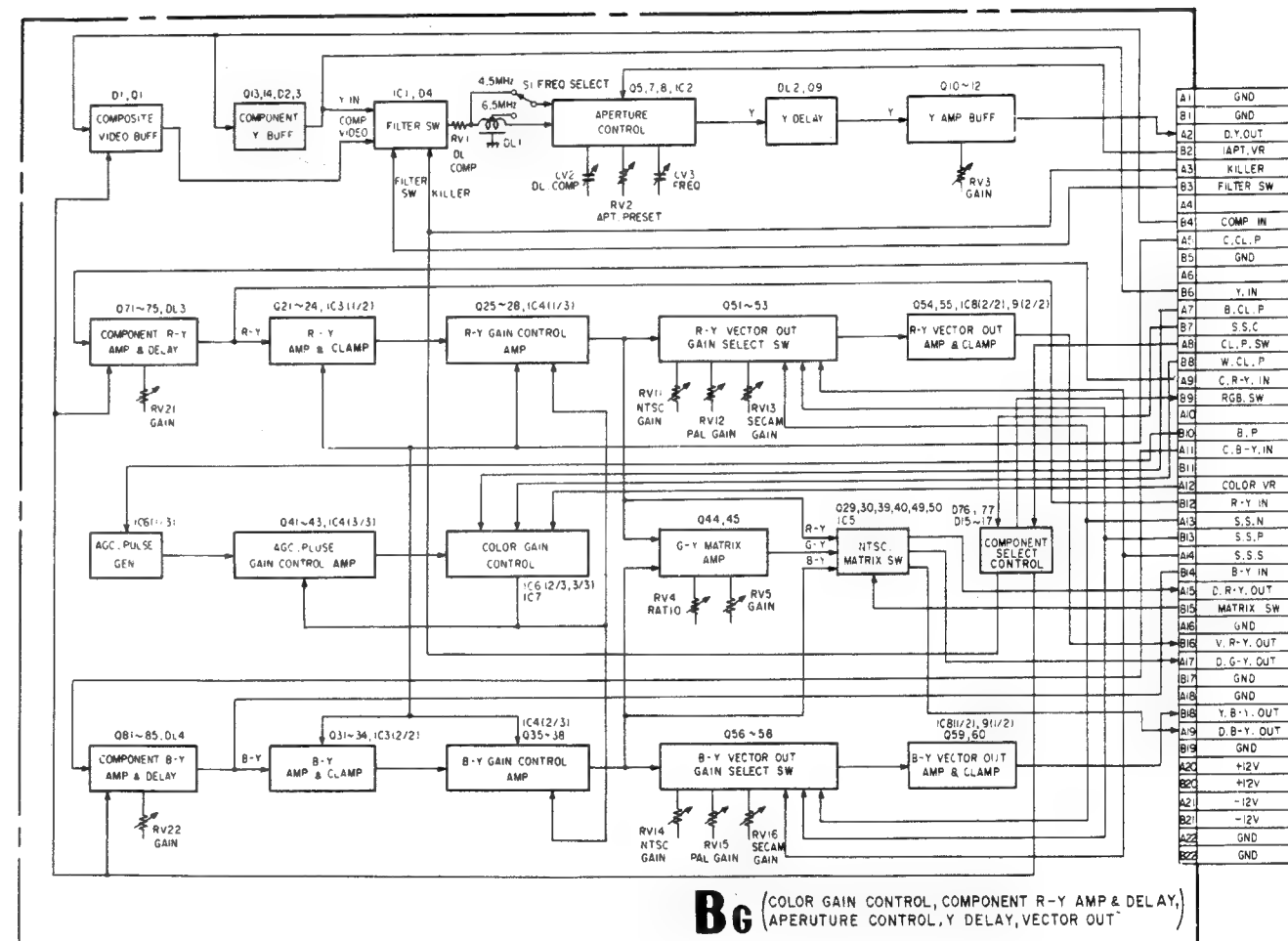
3-3. BH BOARD

3-3-1. Switching Circuit Between Y (Luminance) Signal, Color Difference Signal and RGB Signal, AGC Pulse Insertion, Y-C Matrix

Switching Circuit of Y Signal, Crosshatch Signal and SET UP Signal, Buffer

Y signal, crosshatch signal and SET UP signal are selected by the switcher (IC1 (1/3) (2/3)) and selected signal is output via buffer Q1.

Switching Circuit of R-Y Signal, Red Signal and SET UP Signal (Same as B-Y, G-Y Signal)

R-Y signal, Red signal, SET UP signal are selected by IC2 (1/3, 2/3) and selected signal is output via buffer Q4.

Y Signal Screening (Same as R-Y, B-Y, and G-Y Signals)

The signal is performed SAMPLE and HOLD (S/H) at the back porch of signal by transistor Q2 and IC5 (2/2). Y screening is performed by replacing S/H output signal, by the original signal.
For color difference signals screening is made at the Horizontal Sync portion.

Red Matrix, Blue Only SW, Buffer (Same as Green and Blue)

Red is obtained by Y-C matrix circuit composed of resistor network CP9 from color difference signals.
AGC pulse from pulse generator is inserted into Red signal for contrast control.
IC7 activates by the Blue only SW on the front panel. Blue only SW is used for the display of blue signal as a monochrome picture.

3-3-2. Contrast Control, Brightness Control, Peak Limitter

Red Contrast, and Brightness Control Amplifier (Same as Green and Blue)

This is a variable gain control amplifier composed of variable resistor element IC101 and transistor Q102 and Q103. By controlling the voltage at pin ④ of IC101. contrast control is performed. and brightness control is done by controlling the bias voltage of transistor Q102.

Red limitter (Same as Green and Blue)

When excess input signal comes in . amplitude is limitted by the limitter composed of transistors Q104 and Q105.

Red Contrast Control

AGC pulse inserted in Red signal is clamped by transistor Q107 and sampled by transistor Q108.
Amplitude of above AGC pulse is compared with the reference voltage applied from CONTRAST control on the front panel in IC102 (2/2).
Contrast control is performed by controlling the gain of Red contrast brightness control amplifier so that these voltages may match.

Red Brightness Control (Same as Green and Blue)

The black level of Red signal is performed SAMPLE and HOLD (S/H) by transistor Q106. This S/H voltage is compared with the reference voltage applied from Brightness control on the front panel in IC102 (1/2). Brightness control is performed by controlling the bias of Red contrast Brightness control amplifier so that these voltages may match.

A1	GND
B1	GND
A2	C.H. IN
B2	D.Y. IN
A3	R. IN
B3	S.S. N
A4	RGB . SW
B4	D.R - Y. IN
A5	G. IN
B5	S.U. SW
A6	W. SW
B6	D.G - Y. IN
A7	B. IN
B7	C.H. SW
A8	S.U. VR
B8	D.B - Y. IN
A9	GND
B9	GND
A10	C.CL. P
B10	Y.CL. P
A11	C. BLK . P
B11	B.O.SW
A12	CHAR . BLK
B12	Y. BLK . P
A13	B. P
B13	AFC. P
A14	DL.SW
B14	
A15	BRT. VR
B15	R.OUT
A16	B. CL . P
B16	CHAR. IN
A17	CONT . VR
B17	G.OUT
A18	W. CL . P
B18	GND
A19	
B19	B.OUT
A20	+12V
B20	+12V
A21	-12V
B21	-12V
A22	GND
B22	GND

Y/COLOR DIFFERENCE/RGB
SIGNAL SWITCHING,
Y/C MATRIX, CONTRAST/
BRIGHTNESS CONTROL

BH
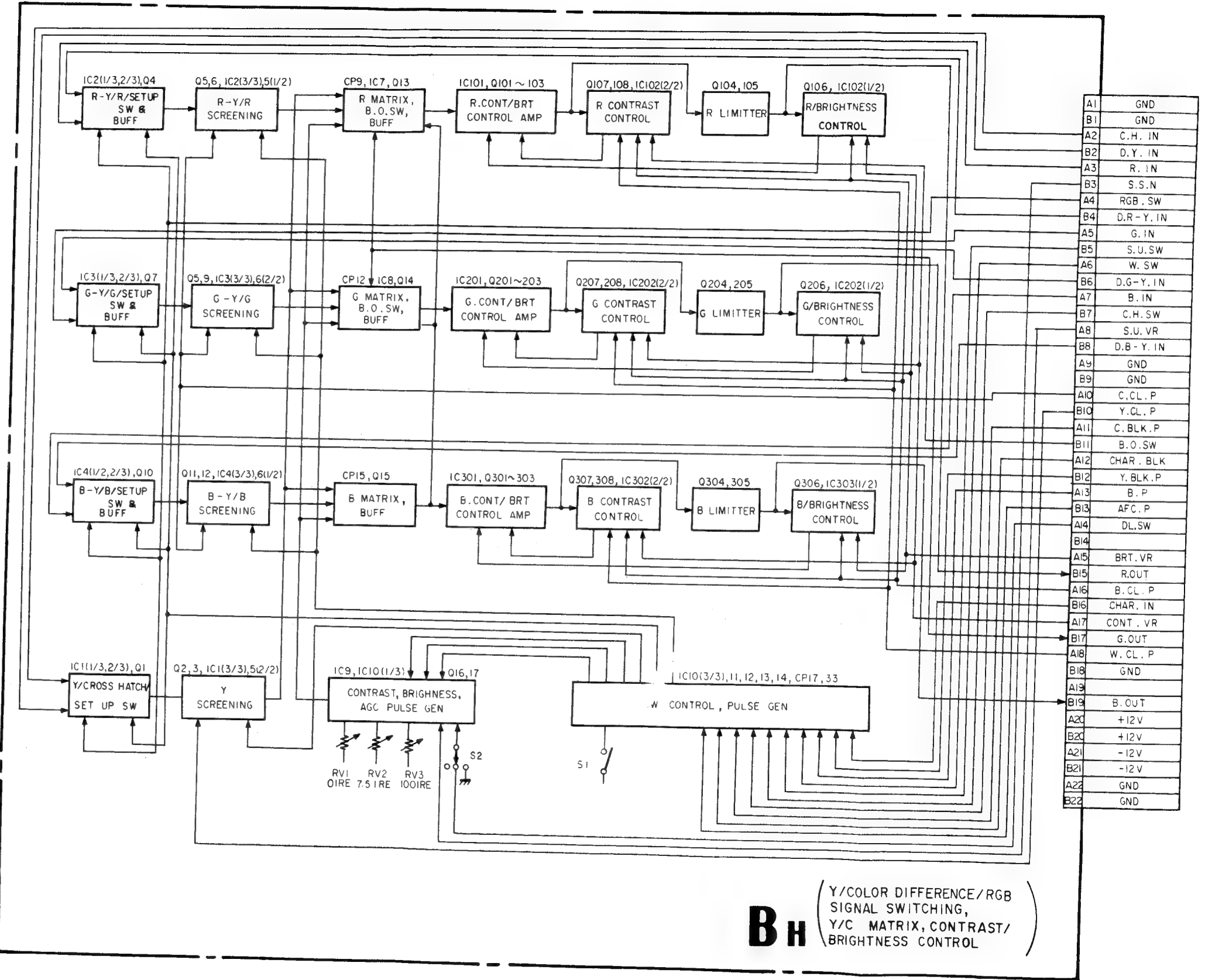
3-4. BI BOARD

3-4-1. Red Screen SW, AGC Pulse Insertion
(Same as Green and Blue)

Red signal can be cut off by RED SCREEN SW on the front panel. Horizontal rate AGC pulse is removed and the reference pulse is inserted in the signal for the GAIN and BIAS adjustment of video output amplifier and for the beam control circuit.

3-4-2. Red Limitter, Gain Bias Control Amplifier

This limitter is used for limiting the excess input level of the signal below 0V DC.

The GAIN/BIAS CONTROL amplifier is composed of variable resistor element and transistors as same as contrast control amplifier' (See section of BH board)

3-4-3. Red Feedback Amplifier, Red Gain Control
Red Bias Control Circuit

RED FEEDBACK amplifier inverts the phase of the signal derived from VIDEO OUTPUT amplifier via NF BUFF (Negative Feedback Buffer) in BK board.

The BIAS of VIDEO OUTPUT AMPLIFIER is controlled by RED BIAS CONTROL circuit so that the black level of inverted signal may be 0V DC.

(This time, black level of VIDEO OUTPUT will be −90V DC.)

RED GAIN CONTROL circuit controls the gain of VIDEO OUTPUT AMPLIFIER so that the level of the reference pulse may match to the voltage at pin ③ of IC103.

(When GAIN control (RED) in the drawer is turned, the level of the reference pulse inserted in section 1 changes. And amplitude (Gain) of Red signal changes so that the amplitude of the reference pulse derived from RED FEEDBACK amplifier may be maintained constant by GAIN CONTROL circuit.)

3-4-4. Red Cathode Current Detection, Red G1 Control
Circuit (I-V Conversion)

Refer to the BK board section of beam control circuit

3-4-5. ABL Detector, Drive Control, Over Drive

The reference level of GAIN CONTROL circuit is controlled by ABL detector and DRIVE CONTROL so that the cathode current of CRT exceeds the predetermined (Preset) value to prevent damage of CRT. OVER DRIVE circuit lights up the OVER LOAD LED on the front panel for warning.

3-4-6. G2 Control Circuit

Circuit diagram of G2 control circuit is shown in Figure 6.

The signal for G1 BIAS control is fed to base of the transistor Q11 from RED G1 BIAS control circuit. (Same as G and B)

Only one of the highest voltages among the base voltages of transistors Q11-Q13 is turned on and is compared with the reference voltage of base voltage Q14.

And this circuit drives transistor Q105 located in PA board so that Transistor Q105 in PA board drives G2 voltage for adjusting cut off level of CRT.

Base voltage of transistor Q14 (reference voltage) is set so that the voltage of Black level at G1 electrode may be −120V DC and maintain Ekco (cut off voltage) −120V constant.
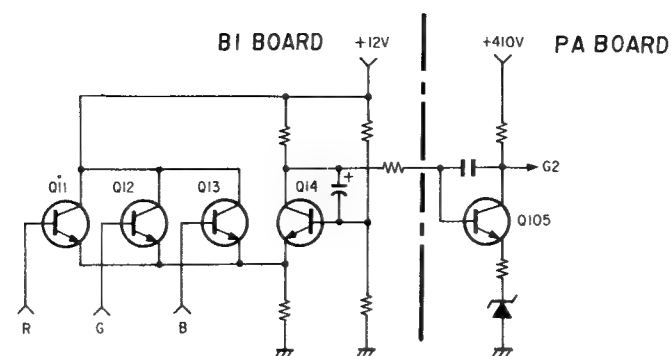
Figure 6

BLOCK DIAGRAM OF BI BOARD

A1	GND
B1	GND
A2	OVER LOAD
B2	ABL.IN
A3	B.CL.P
B3	
A4	R.GAIN
B4	R.IN
A5	R.OUT
B5	GND
A6	R.CL.BIAS
B6	K.R
A7	R.DRIVE.IN
B7	R.BIAS
A8	G.GAIN
B8	G.IN
A9	G.OUT
B9	G2.CONT
A10	G.CL.BIAS
B10	K.G
A11	G.DRIVE.IN
B11	G.BIAS
A12	B.GAIN
B12	B.IN
A13	B.OUT
B13	GND
A14	B.CL.BIAS
B14	K.B
A15	B.DRIVE.IN
B15	B.BIAS
A16	BLUE.OUT
B16	BM.CL.P
A17	R.SW
B17	D.CL.P
A18	G.SW
B18	BM.P
A19	B.SW
B19	DRIVE.P
A20	+12V
B20	+12V
A21	−12V
B21	−12V
A22	GND
B22	GND

B1 (DRIVE CONTROL, BEAM CURRENT CONTROL)

3-5. SYNC PROCESSOR, PULSE GENERATOR (BJ BOARD)

3-5-1. 1H Pulse Processing

The composite sync is separated from incoming signal at BA board. And 1H sync is made by separating V sync and equalizing pulse from composite sync.
Also H sync which has constant pulse width is made from 1H sync.

3-5-2. 2fH Multivibrator

This circuit generates 2fH rate pulse from H rate flyback pulse.

3-5-3. Vertical Counter

The 2fH rate pulse is counted down to generate Vertical rate trigger pulse for vertical deflection circuit.
When there is no incoming signal, trigger pulse is generated by vertical counter (384H).
When there is incoming signal with V sync, this counter circuit is reset by V sync and generates trigger pulse synchronized with V sync.
Also in order to increase stability of vertical scanning, noise gating process is made during V sync period.

3-5-4. V Sync and Delay

V sync and V BLANKING pulses are generated by output trigger pulse from vertical counter.
And when V DELAY SW on the front panel is selected ON, these pulses are generated in a V/2 delayed position relative to the V sync position of incoming signal.

3-5-5. Crosshatch Generator

Internal crosshatch signal is made as follows.
The vertical lines are generated by approx. 18fH rate pulses synchronized with flyback pulse.
And flyback pulse is counted down to generate horizontal lines.

3-5-6. Burst Gate Pulse, Y-CLAMP Pulse, C-CLAMP Pulse Generator

The Burst Gate Pulse (B.G.P.), clamp pulse for luminance signal (Y.CL.P) and clamp pulse for color difference signal (C.CL.P) are generated from 1H sync via LCR network and transistors.

3-5-7. Picture Set Up Pulse Generator

This is the gate pulse generator for picture set-up function, and consists of mono multipliers.

3-5-8. Split, Y Blanking, C Blanking Pulse Generator

Y BLANKING pulse (Y BLK P) and C BLANKING pulse (C BLK P) are generated. These pulses are used for the purpose of DC restoration of color difference signal, Y signal and RGB signal. DC restoration is made by inserting the black reference signal during blanking period in the signal. Also C.BLK. pulse is mixed with vertical rate blanking signals for SPLIT display and for B/W display.

3-5-9. Horizontal Rate AGC and Clamp Pulse Generator

COLOR GAIN control, CONTRAST control and BRIGHTNESS control are stabilized by insertion of reference signal and using feedback circuit. Horizontal rate BLACK pulse (B.P), BLACK CLAMP pulse (B.CL.P) and WHITE CLAMP pulse (W. CL.P) are generated here.

3-5-10. Vertical Rate AGC and Clamp Pulse Generator

In this model, BEAM CONTROL circuit is used for high stability in white balance.
The reference signal is inserted in the signal for gain control circuit in video output amplifier and for beam control circuit. Vertical rate pulses are used for this purpose.
Vertical rate BEAM PULSE (BM.P) DRIVE PULSE (DRIVE.P) and BEAM CLAMP PULSE (BM.CL.P) are generated here.

3-5-11. Others

Black reference is determined at the position of clamping in black reference insertion circuit for both color difference signal and RGB signal. Accordingly C.CL.P is used as clamp pulse for color difference signal processing and Y.CL.P is for RGB signal. CLAMP PULSE SELECTION SW switches C.CL.P. or Y CL.P to the clamp pulse for the insertion of black reference.

BLOCK DIAGRAM OF BJ BOARD
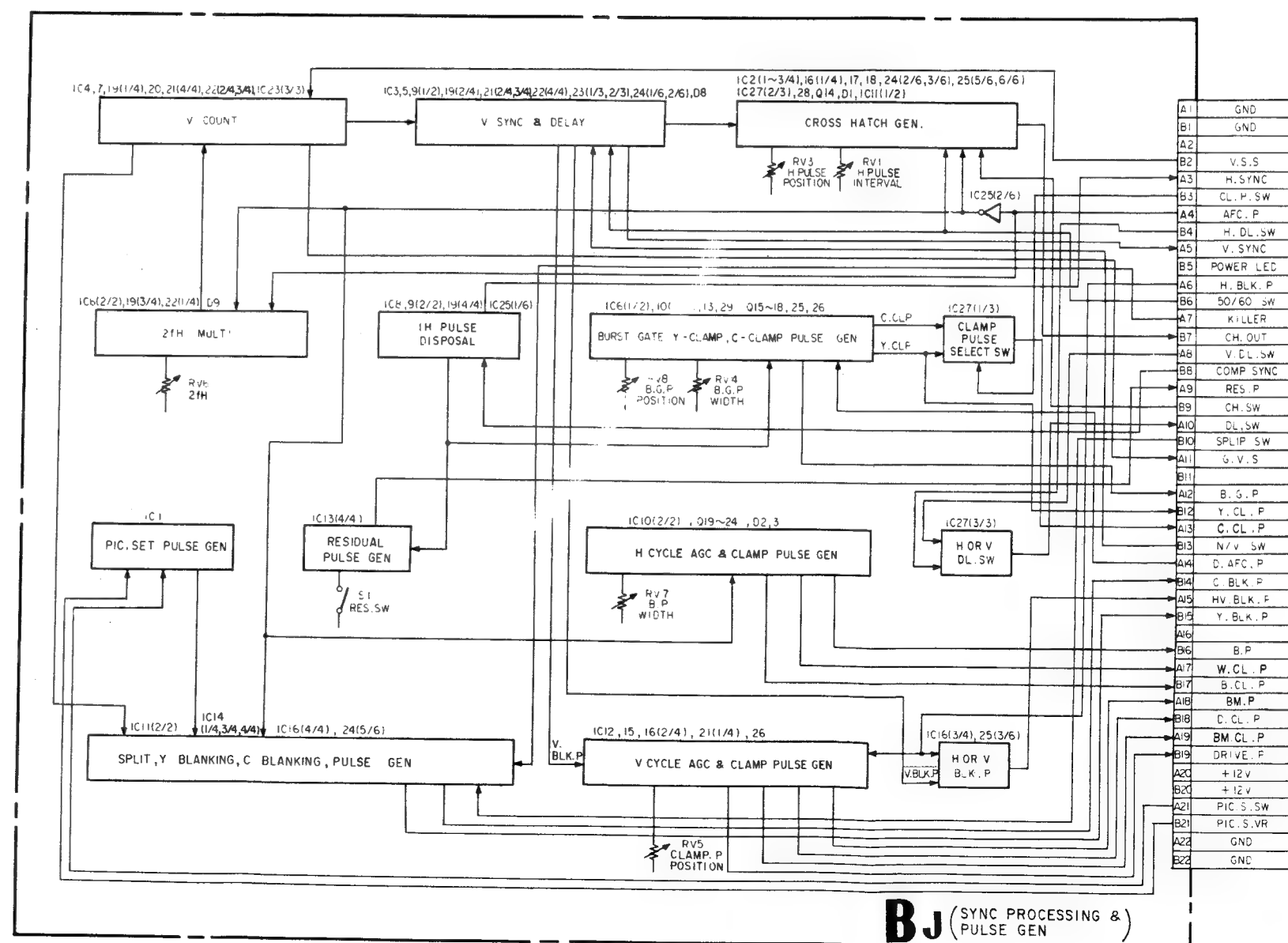
TIMING CHART OF MAJOR PULSE (BJ BOARD)

	T1 (µs)	T2 (µs)
COMP. SYNC	0.4	4.8
AFC.P	0.4	9.0
Y.BLK.P	0.5	7.2
D.AFC.P	0.6	7.2
B.G.P	4.7	4.1
Y.CL.P	5.9	2.6
C.CL.P	1.3	3.0
H.SYNC	0.6	5.5
H.BLK.P HV.BLK.P DRIVE.P	-0.3	9.0
C.BLK.P	0.5	7.2
B.P	0.5	3.5
B.CL.P	1.1	1.8
W.CL.P	4.4	1.8
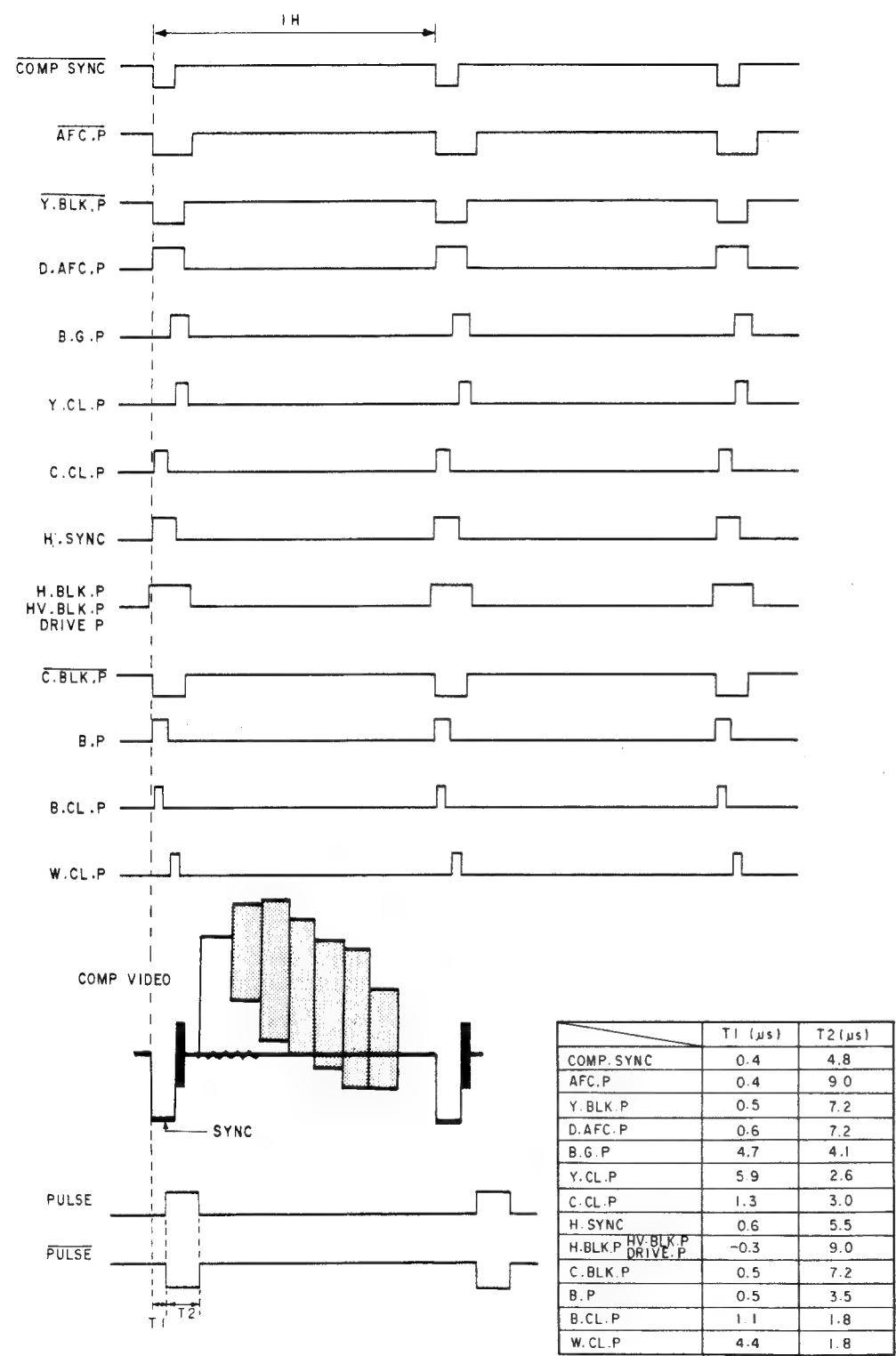
Figure 7

FIELD 1 VERTICAL BLANKING
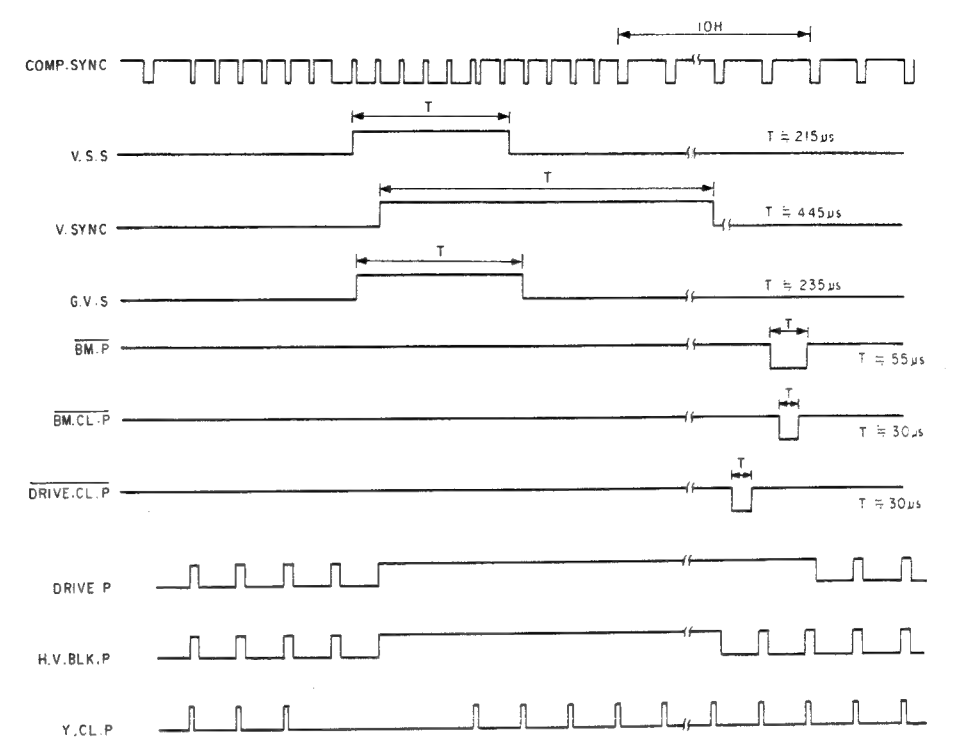
Figure 8

FIELD 2 VERTICAL BLANKING
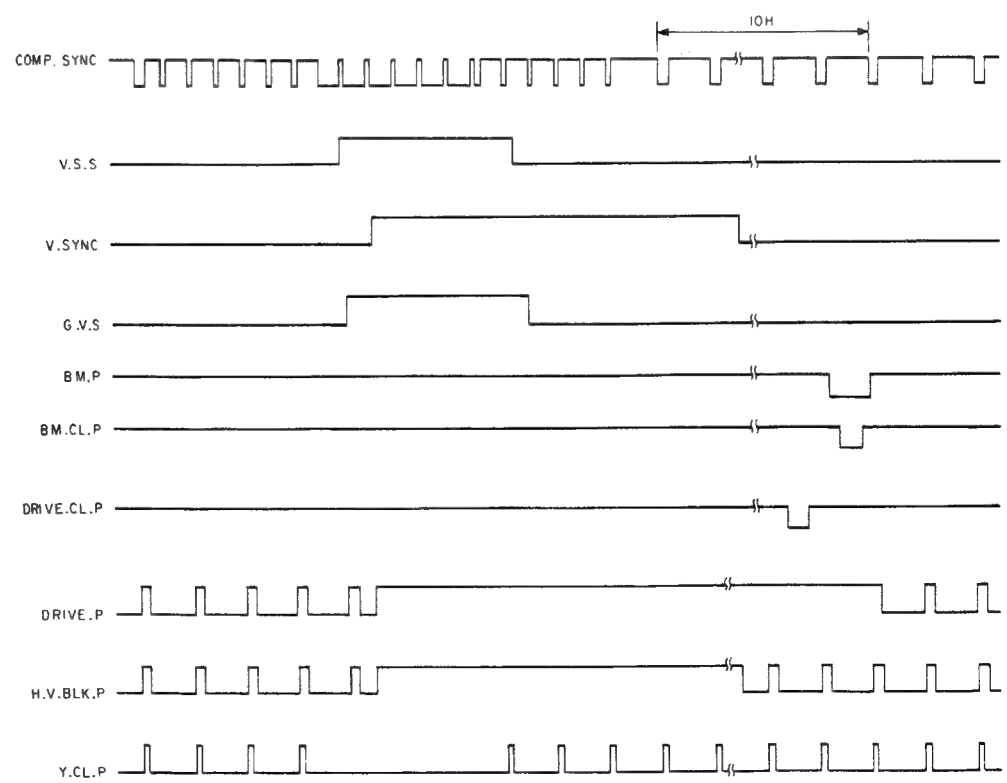
Figure 9

3-6. BK BOARD

Following are described about Red channel. Green and Blue channel are the same.

3-6-1. Red Drive Amplifier, Red Buffer

This circuit drives final stage of video output amplifier. Gain is approx. 2

3-6-2. Red Video Output Amplifier and Buffer

This is the final stage amplifier to obtain amplitude enough to drive G1 of CRT.
Gain is approx. 14
Also in this amplifier, BLANKING pulse is mixed with video signal.

BLOCK DIAGRAM OF BK BOARD
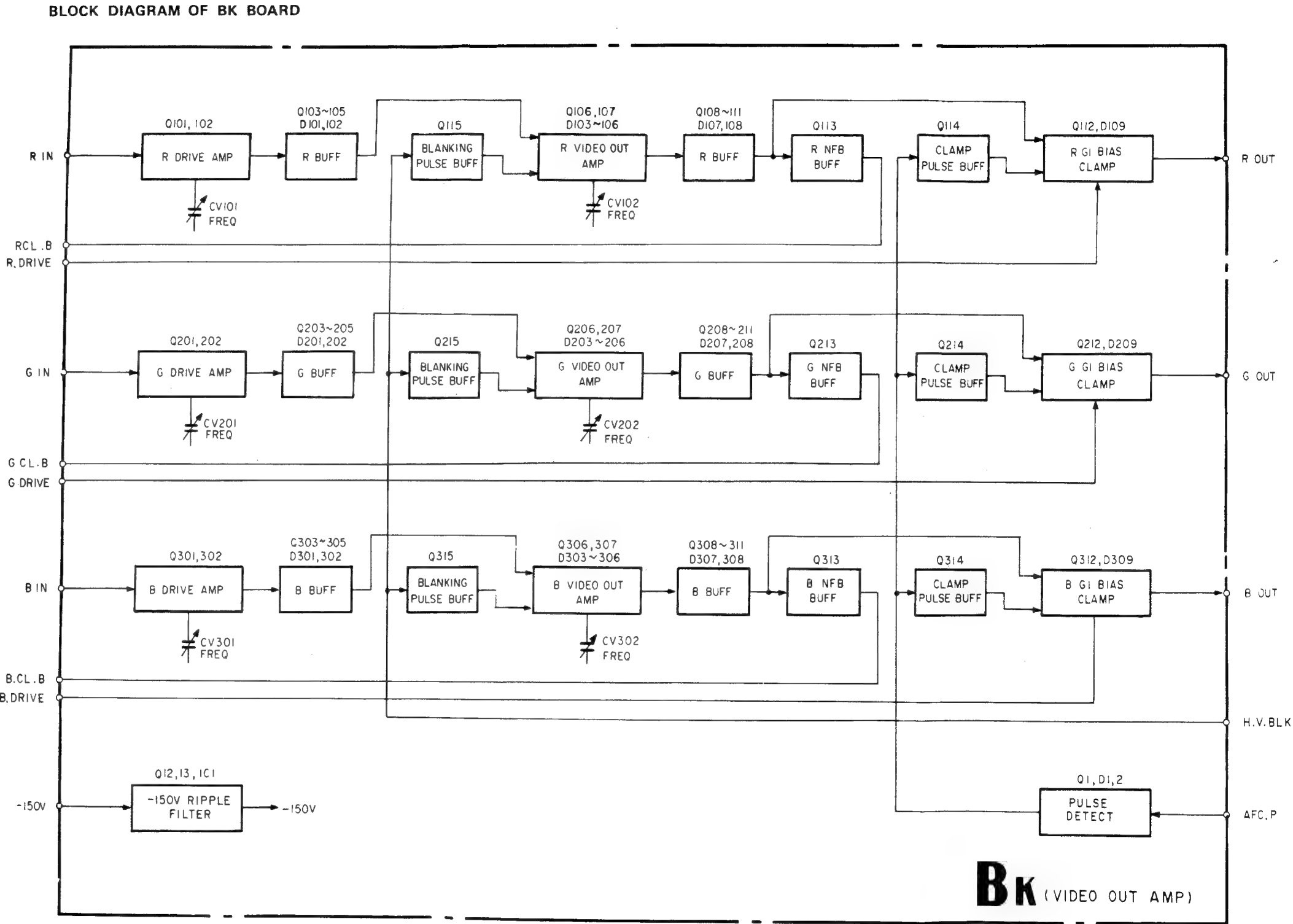
3-7. BEAM CONTROL CIRCUIT (BI, BK BOARDS)
(Same as Green and Blue)

Block diagram is shown in Figure 10.

3-7-1. Detection of Cathode Current and I-V Conversion (BI BOARD)

Cathode current is detected as a voltage by using IC105 (1/2)

3-7-2. Red G1 Bias Control (BI BOARD)

BMP is inserted in the signal during vertical blanking in BI board.
This BMP is detected as a cathode current and sampled by BM CLP applied to FET Q113.
This bias control circuit controls the base voltage of transistor Q114 so that converted voltage from cathode current and the reference voltage may match.

3-7-3. Red G1 Bias Clamp Circuit (BK BOARD)

Video output signal is clamped at the voltage of collector of transistor Q114 in BI board by using transistor Q112.
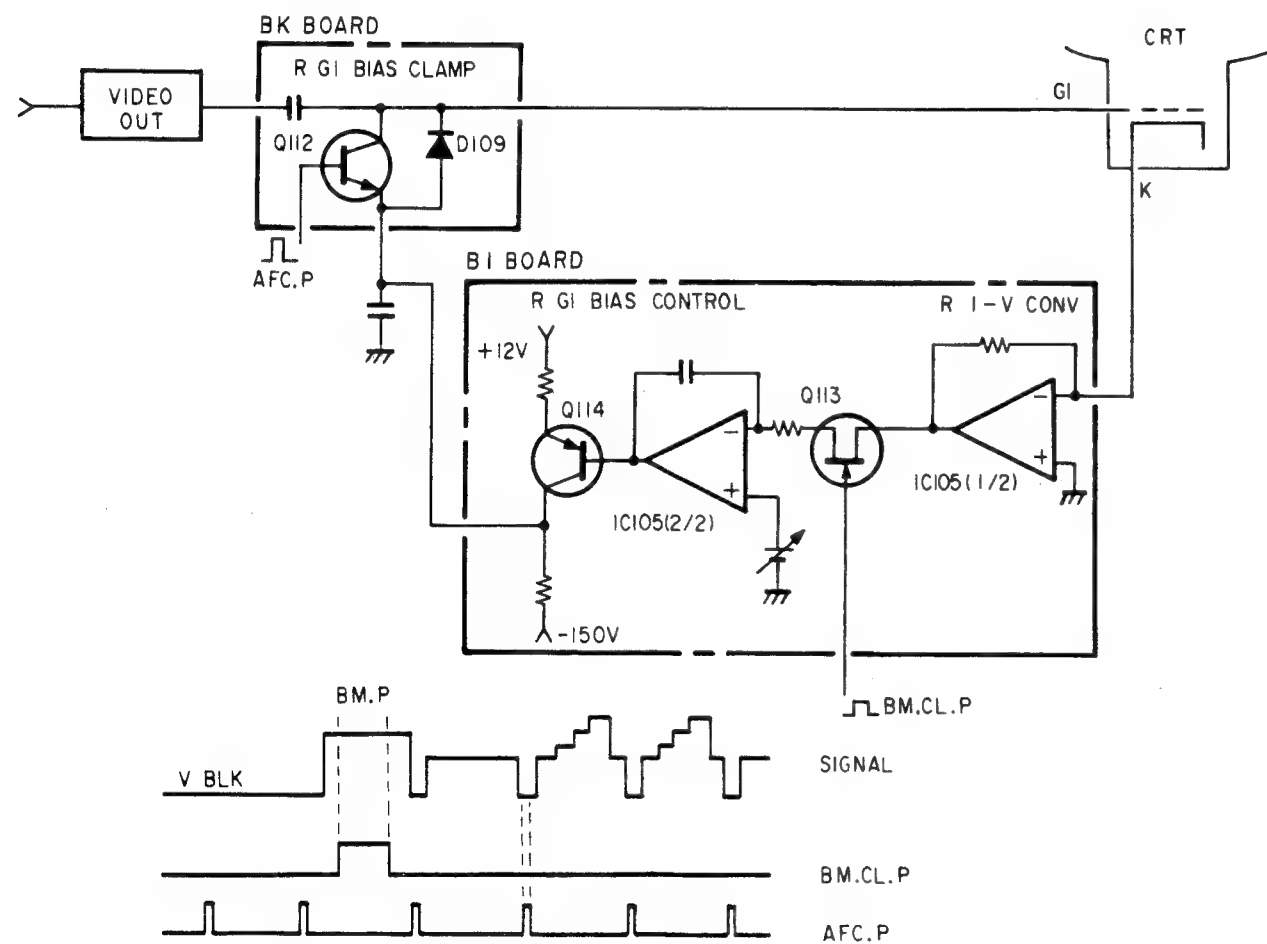
Figure 10

3-8-1.   3 Line Dynamic Comb Filter (Fig. A)

The fed video signal is band limited by a low-pass filter. (This signal is hereinafter referred to as the 0H signal.) The 0H signal becomes the signal which is 1H (63.556 μsec) delayed by the 1H delay circuit (1H delayed signal) and the signal which is 1H further delayed by the 1H delay circuit (2H delayed signal).

The 0H, 1H, and 2H signals are band limited by the respective band-pass filters (center frequency: fs) for delay of $\lambda/2$ (140 nsec). The 1H signal is further $\lambda/2$ delayed. The 0H+$\lambda/2$, 1H, 1H+$\lambda/2$, 1H+λ and 2H+$\lambda/2$ (Ⓐ, Ⓑ, Ⓒ, Ⓓ and Ⓔ of the block diagram) at each point are separated into chroma signals only by the correlation circuit (IC501).

The luminance signal is separated with the chroma signal subtracted from the 1H signal.

3-8-2.   2 Line Simple Comb Filter

The chroma signal is separated with the 0H+$\lambda/2$ and 1H+$\lambda/2$ signal subtracted, and the luminance signal is separated by subtracting the chroma signal from the 0H signal.

3-8-3.   1H Delay Circuit (Fig. B)

The 1H delay circuit consists of two CCD delay lines.

These CCD delay lines are used in parallel to attain 1H (63.556 μsec) signal delay.

3-8-4.   Band-pass Filter (Fig. C)

The band-pass filter consists of a delay line. It performs band limiting with the group delay kept constant.

3-8-5.   Correlation Circuit (IC501) (Fig. D)

The correlation circuit consists of a limiter circuit which is common to emitters to perform separation of a chroma signal.
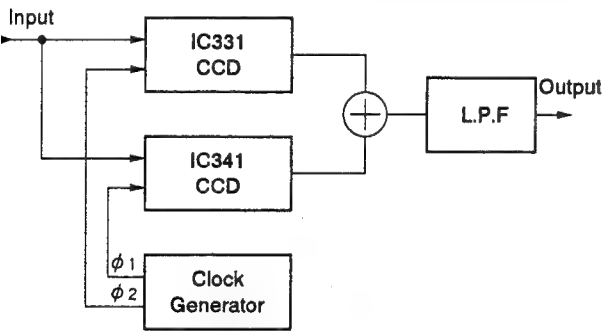
Figure B
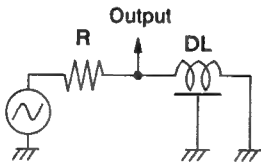
Figure A
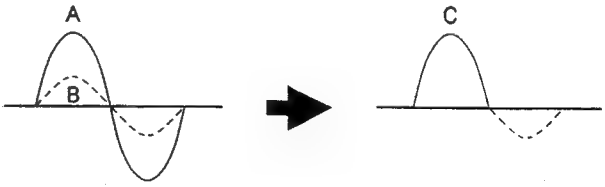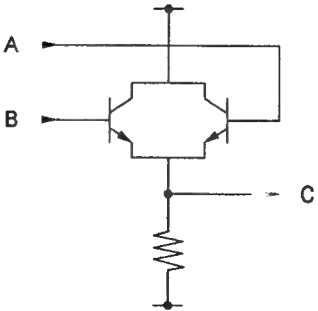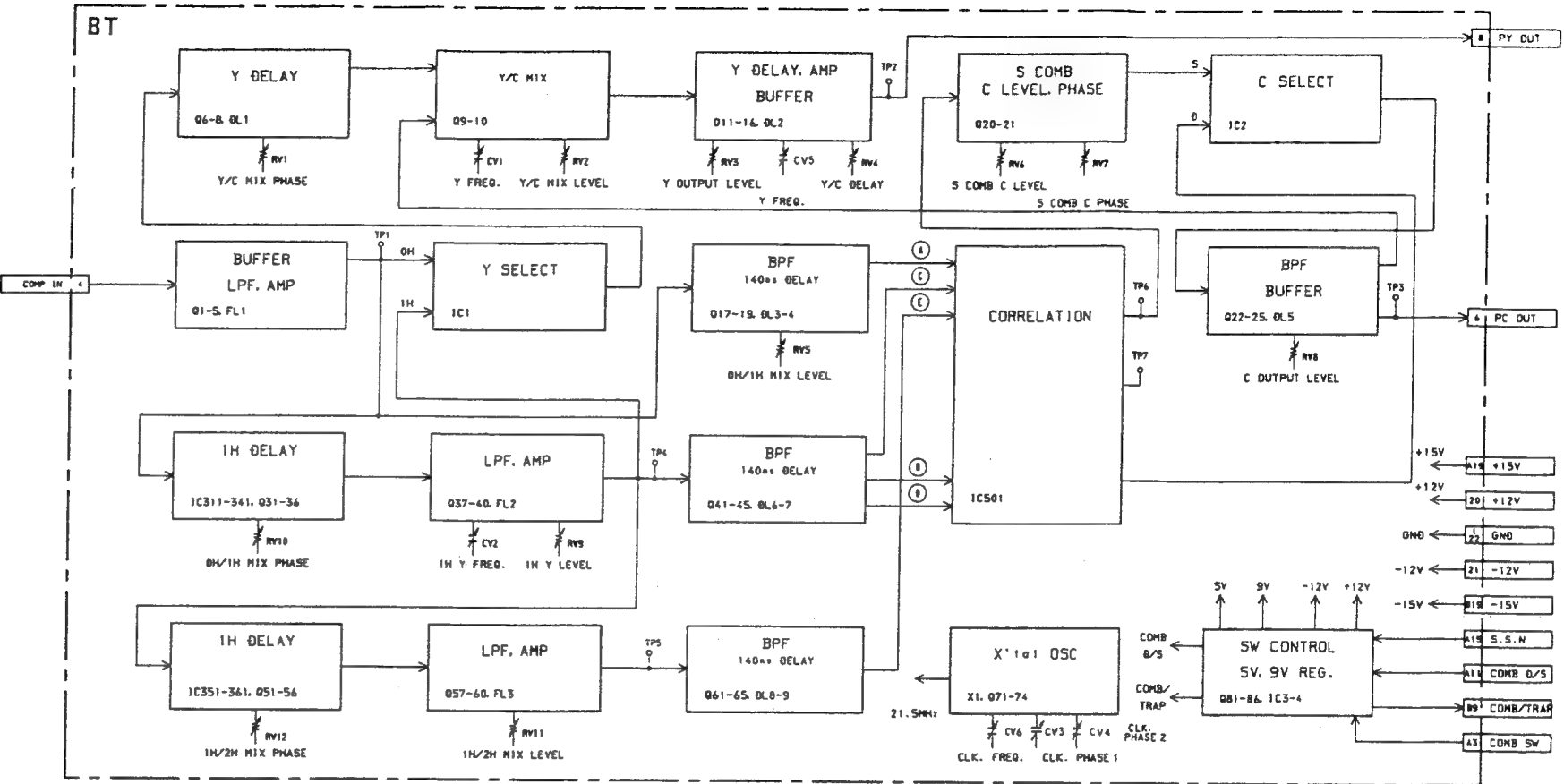
Figure C

Figure D

(BVM-2011P ONLY)

3-9. PAL DEMODULATOR, Y TRAP CIRCUIT (BD BOARD)

The composite video signal (PAL) supplied from BA board is fed to transistor Q1 (buffer), then is supplied to the 4.43 MHz trap circuit with Y signal and to band pass filter with chrominance signal.

3-9-1. Chroma Band Pass Filter

The composite video signal obtained from at the emitter of transistor Q1 is fed to the Band pass filter composed of resistor R12, capacitor C7, C8, inductor L3 and transistor Q5.
The center frequency of this filter is adjusted to the subcarrier frequency (4.43 MHz) by L3, and chrominance signal is derivied from Q5.

3-9-2. Residual SW Circuit

The chrominance signal derivied at transistor Q5 is fed to analog switcher IC2.
When switch S1 on BJ board is set to ON position, residual pulse which has almost same phase as H sync is fed to control terminal of analog switcher (pin ③ of IC2) and screening is performed during H sync period.
When switch S1 on BJ board is set to OFF position, Low level signal (0V DC) is fed to control terminal and screening action is not performed. Thus residual switch circuit does not activate.
When there is residual subcarrier in the video signal, clamp level of color difference signal changes by turning switch S1 ON/OFF and therefore residual subcarrier can be checked on the picture as a color shift.

3-9-3. Chroma Amplifier Circuit

The chrominance signal from residual switch circuit (IC2 pin④)) is fed to chroma amplifier circuit (Q19, Q36).
After the chroma signal is amplified by the inversion amplifier (gain: 1X), it is voltage divided by resistors R400 and R314 and then input to the R-Y input terminal (IC1, pin (3)) and B-Y input terminal (IC1, pin (2)) of the following demodulator circuit via the buffer (Q38).

3-9-4. Phasa Control Circuit

The chrominance signal from residual switch is also fed to phase control circuit (Q6, Q7, Q8, Q9, D12).
In this circuit, a variable capacitance diode (D10) is used to control the phase of color burst signal.
Anode voltage of D10 is applied by variable resistor RV8 and preset adjustment of phase is made by this variable resistor.
When the PHASE control on the right side of the front panel is turned, DC level of phase control signal (board terminal A13) changes and this phase control signal is fed to the cathode of D10 via analog switcher (IC5). In this way, Burst phase of chrominance signal is controlled according to the DC level of the phase control signal.
When PAL-D is selected with the PAL switch inside the right side drawer, between pins ③ and ④ of IC5 becomes conductive and phase control becomes dependent on RV7, disabling the Phase Control of the right side front panel.

Analog switcher IC5 (1/3) activates to make short-circuit between input terminal pin ③ or ⑤ and output terminal pin④, only when COLOR STANDARD SELECTOR in the right side of drawer is selected to PAL and otherwise pin ⑤ kept open circuit.
As above phase controlled chrominance signal is derived from collector of transistor Q9 and burst signal in this signal is gated by IC6. The gated burst signal is fed to the burst input terminal pin ⑪ of demodulator IC1.

3-9-5. PAL Demodulator

Block diagram of IC used for PAL demodulator is shown in Figure E. This IC is designed for use of NTSC demodulator.
When chrominance signal is fed to pin ② and pin ③ , color burst signal to pin ⑪ and Burst Gate Pulse (B.G.P.) to pin ⑬ , R-Y and B-Y color difference signals are obtained at output terminals pin ㉓ and pin ㉔
The demodulation axes of this demodulator are R-Y axis and B-Y axis. Variable capacitor CV1 is adjusted so that the phase angles between them are 90°.
Local oscillator (4.43 MHz) is formed by CW oscillator in IC1 connected to the terminal pin⑤, ⑥, ⑦, ⑧ and external circuit.
The variable capacitor CV2 is adjusted so that the free run frequency may be subcarrer frequency 4.433619 MHz.
Also APC (Automatic Phase Control) circuit is formed by APC section in IC1 connected to the terminal pin ⑨ and ⑩ local oscillator is controlled by APC circuit.
The color difference signals demodulated by this IC are fed to low pass filter, where high frequency component is removed, then R-Y and B-Y color difference signals are obtained.
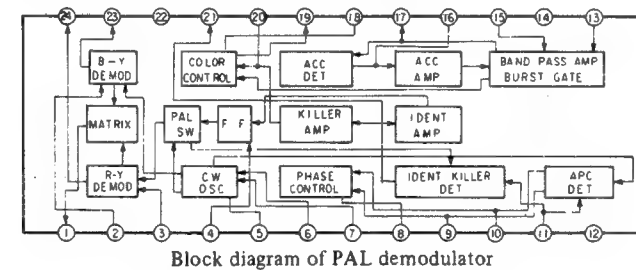
Block diagram of PAL demodulator
Figure E

3-9-6. PAL-D Matrix and PAL S/D Switching Circuit

This circuit is further divided into circuits for the R-Y and B-Y signals, but the operation of both circuits is the same. So only the R-Y one will be explained.
R-Y signals input from the demodulator circuit are input to Q20 (BUFF) and Q21 (BUFF).
The signals input to Q21 are then input to pin ② of the analog switcher (IC5). When PAL S has been selected, between pins ② and ⑮ becomes conductive and the signals are supplied to the following circuit via Q33 (BUFF).
The signals input to Q20 are formed by IC7 and Q18.
Bias is controlled by a clamp circuit and is input to pin ⑮ of the 1H delay line (IC3). The DC level of the input is adjusted to the optimum value by using RV9.
IC3, driven by the 10.64 MHz clock signal generated by the clock generator circuit configured with XZ, Q34 and Q35, delays the input signal by 1H cycle and outputs it from pin ⑪ .

The high frequency component of the signal thus output is removed by the low-pass filter configured with Q22 and Q23, after which the signal is input to the following PAL-D matrix circuit.
The PAL-D matrix circuit is configured with R100, R101 and Q24. The signal that was not delayed is input through R100 while the 1H delayed signal is input through R101 at a ratio of 1/2.
The PAL-D signal added to the base of Q24 is obtained from its emitter. The signal obtained from the Q24 emitter is input to pin ① of IC5. When PAL-D is selected, between pins ① and ⑮ becomes conductive and the signal is supplied to the following circuit via Q33 (BUFF).

3-9-7. 4.43 MHz Trap Circuit, Phasa Compensation, Y Delay Conrrection Circuit

The composite video signal from the emitter of transistor Q1 is fed to 4.43 MHz trap circuit composed of resistor R5, R6, R7, capacitor C1, C2 and inductor L1.
Adjustment of L1 is made so that the resonance frequency of this trap circuit should be subcarrier frequency.
Y (Luminance) signal removed subcarrier is obtained at output terminal of the trap circuit and is fed to the phase compensation circuit. (Transistor Q2, resistor R8, R9 R10, inductor L2 capacitor C4)
This circuit compensates phase delay of the signal at high frequency due to the trap circuit.
Y signal compensated phase delay is fed to Y-delay circuit. In this circuit Luminance/Chrominance time error is compensated by delay line.

3-9-8. Color Standard Selector

When PAL system is not selected by the COLOR STANDARD SELECTOR in the right side drawer, transistor Q101, Q102 are cut off and ±12V line power source is not supplied to the demodulator circuit.

BLOCK DIAGRAM OF BD (PAL) BOARD

BD (PAL DECODER Y TRAP)
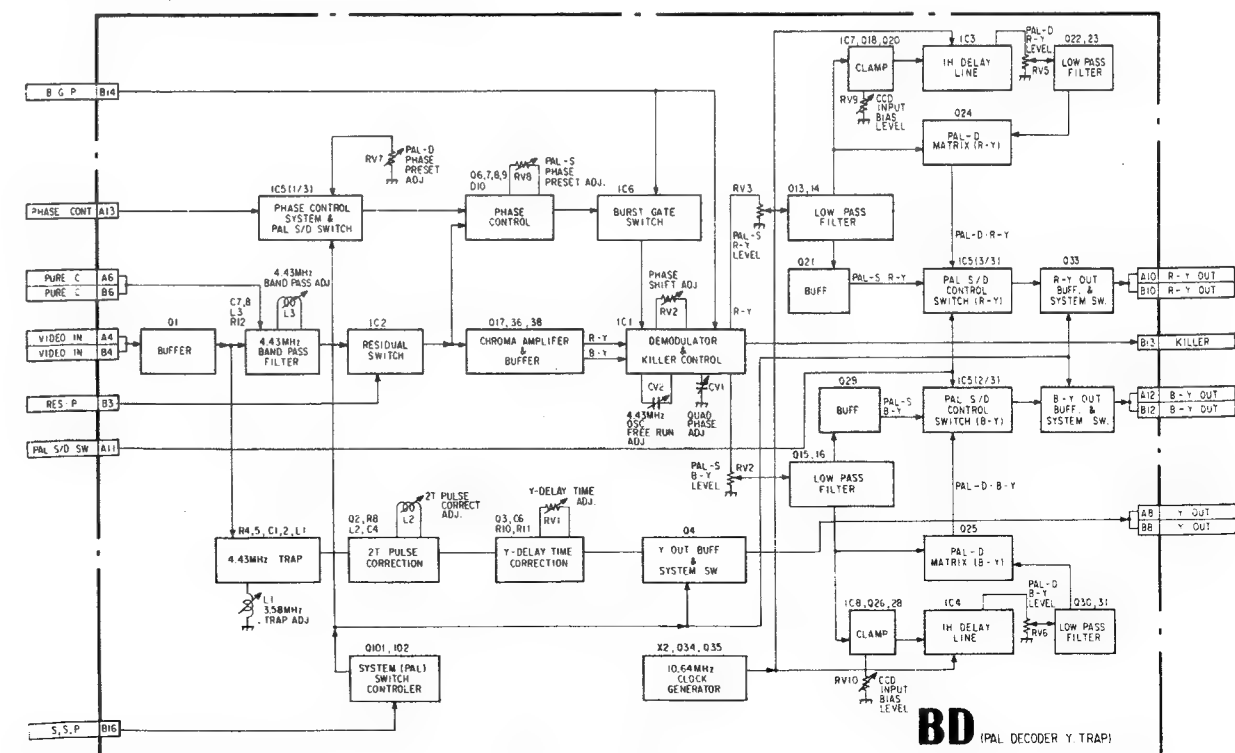
(BVM-1911 ONLY)

3-10. NTSC DEMODULATOR, Y TRAP CIRCUIT (BC BOARD)

The composite video signal (NTSC) supplied from BA board is fed to transistor Q1 (buffer), then is supplied to the 3.58MHz trap circuit with Y signal and to band pass filter with chrominance signal.

3-10-1. Chroma Band Pass Filter

The composite video signal obtained from at the emitter of transistor Q1 is fed to the Band pass filter composed of resistor R18, capacitor C7, C8, inductor L3 and transistor Q5.
The center frequency of this filter is adjusted to the subcarrier frequency (3.58MHz) by L3, and chrominance signal is derived from Q5.
This circuit selects comb filter (BB board) mode or notch filter mode by a push of button on the front panel. When comb filter mode is selected, comb switch circuit composed of transistor Q103 and Q104 activates and base voltage of Q5 goes down to −12V and Q15 is cut off and then chrominance signal (Pure C) is provided from comb filter circuit to IC2.

3-10-2. Residual SW Circuit

The chrominance signal derived at transistor Q5 is fed to analog switcher IC2 (Pin ⑦).
When switch S1 on BJ board is set to ON position, residual pulse which has almost same phase as H sync is fed to control terminal of analog switcher (pin ③ of IC2) and screening is performed during H sync period.
When switch S1 on BJ board is set to OFF position, Low level signal (0V DC) is fed to control terminal and screening action is not performed. Thus residual switch circuit does not activate.
When there is residual subcarrier in the video signal, clamp level of color difference signal changes by turning switch S1 ON/OFF and therefore residual subcarrier can be checked on the picture as a color shift.

← Residual pulse

H Sync   Color Burst
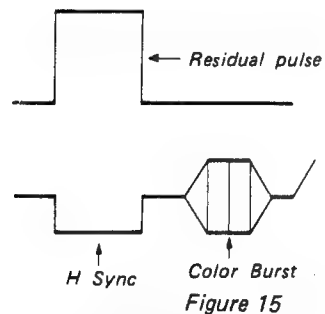
Figure 15

3-10-3. Chroma Amplifier Circuit

The level of chrominance signal from residual switch circuit (IC2 pin ④) is divided by resistor R85 and R86 and is fed to chroma amplifier circuit (Q6, Q7, Q8).
The gain of this amplifier is almost 1 and this amplifier has 2 outputs. They are non-inverted signal and inverted signal.
Non-inverted signal is fed to R−Y input terminal (IC1 pin ③) of demodulator and inverted signal to B−Y input terminal (IC1 pin ②).

3-10-4. Phasa Control Circuit

The chrominance signal from residual switch is also fed to phase contrl circuit (Q9, Q10, Q11, Q12, D2).
In this circuit, a variable capacitance diode (D2) is used to control the phase of color burst signal.
Anode voltage of D2 is applied by variable resistor RV2 and preset adjustment of phase is made by this variable resistor.

When the PHASE control on the right side of the front panel is turned, DC level of phase control signal (board terminal A13) changes and this phase control signal is fed to the cathode of D2 via analog switcher (IC2 Pin ③). In this way, Burst phase of chrominance signal is controlled according to the DC level of the phase control signal.
Analog switcher IC3 (2/3) activates to make short-circuit between input terminal pin ⑬ and output terminal pin ⑭ , only when COLOR STANDARD SELECTOR in the right side of drawer is selected to NTSC and otherwise pin ⑬ kept opn circuit.
As above phase controlled chrominance signal is derived from emitter of transistor Q12 and burst signal in this signal is gated by IC3 (1/3). The gated burst signal is fed to the burst input terminal pin ⑪ of demodulator IC1.

3-10-5. NTSC Demodulator

Block diagram of IC1 used for NTSC demodulator is shown in **Figure 16.**
This IC is designed for use of NTSC demodulator.
When chrominance signal is fed to pin ①, ② and pin ③, color burst signal to pin ⑪ and Burst Gate Pulse (B.G.P.) to pin ⑬ , R−Y and B−Y color difference signals are obtained at output terminals pin ㉓ and pin ㉔ .
The demodulation axes of this demodulator are R−Y axis and B−Y axis. Variable capacitor CV1 is adjusted so that the phase angles between them are 90 .
Local oscillator (3.58MHz) is formed by CW oscillator in IC1 connected to the terminal pin ⑤ , ⑥ , ⑦ , ⑧ and external circuit. The variable capacitor CV2 is adjusted so that the free run frequency may be subcarrier frequency 3.579545MHz.
Also APC (Automatic Phase Control) circuit is formed by APC section in IC1 connected to the terminal pin ⑨ and ⑩ local oscillator is controlled by APC circuit.
The color difference signals demodulated by this IC are fed to low pass filter, where high frequency component is removed, then R−Y and B−Y color difference signals are obtained.

Block diagram of NTSC demodulator
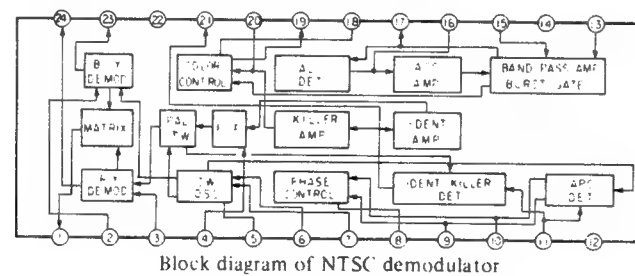
Figure 16

3-10-6. 3.58 MHz Trap Circuit, Phasa Compensation, Y Delay Conrrection Circuit

The composite video signal from emitter of transistor Q1 is fed to 3.58MHz trap circuit composed of resistor R5, R6, R7, capacitor C1 and inductor L1.
Adjustment of L1 is made so that the resonance frequency of this trap circuit should be subcarrier frequency.
Y (Luminance) signal removed subcarrier is obtained at output terminal of the trap circuit and is fed to the phase compensation circuit. (Transistor Q2, resistor R8, R9 R10, inductor L2 capacitor C4)
This circuit compensates phase delay of the signal at high frequency due to the trap circuit.
Y signal compensated phase delay is fed to Y-delay circuit. In this circuit Luminance/Chrominance time error is compensated by delay line.

3-10-7. Color Standard Selector

When NTSC system is not selected by the COLOR STANDARD SELECTOR in the right side drawer, transistor Q101 is cut off and +12V line power source is not supplied to the demodulator circuit.

BLOCK DIAGRAM OF BC BOARD
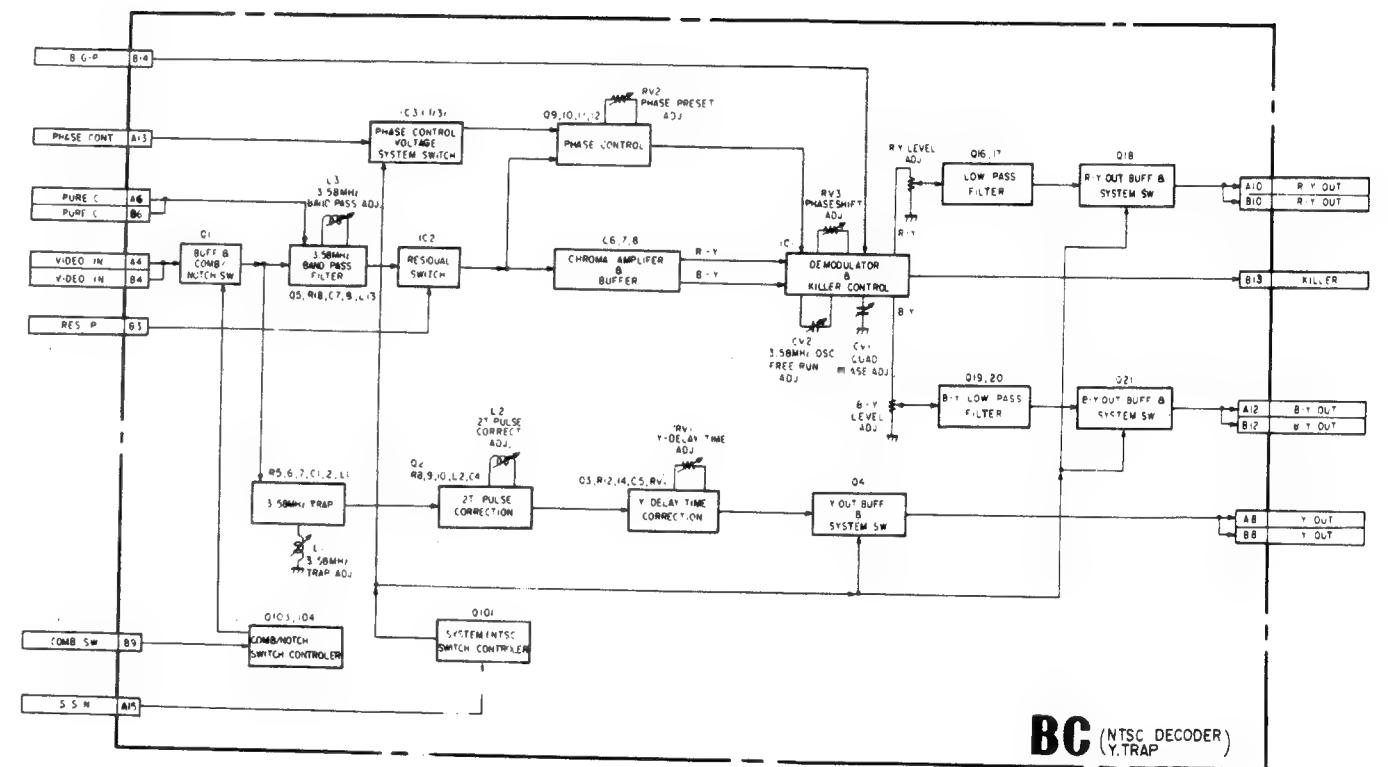
BC (NTSC DECODER Y.TRAP)

3-11. VERTICAL DEFLECTION OUTPUT CIRCUIT CONVERGENCE OUTPUT CIRCUIT (EB BOARD)

3-11-1. Vertical Deflection Output

Vertical Deflection Output amplifier is composed of DC coupled SEPP (single Ended Push Pull) amplifier (Q1~Q5) and boost up circuit.

This boost up circuit contains transistors Q7 and Q8 to reduce power consumption by applying the voltage to the output transistor during vertical retrace time.

Both vertical rate sawtooth waveform and correction waveform for top and bottom pincushion are generated in DA board and fed to output amplifier. Vertical centering is performed by changing DC level of vertical rate sawtooth because Vertical DY (Deflection Yoke) is connected to output amplifier directly.

3-11-2. Convergence Yoke Output Circuit

CY (Convergence Yoke) is used for adjustment of misconvergence of vertical direction. This CY is driven by SEPP (single ended push pull) amplifier (Q9~Q13) and connected directly. Correction waveform is provided from DB board.

3-11-3. DCT (Dynamic Convergence Transformer) Output Circuit

This circuit is used for adjustment of misconvergence for Horizontal direction.

DCT is also driven by SEPP amplifier (Q14~Q19) and AC coupled to it.

Correction waveform is provided to the primary of DCT and transferred to the secondary windings, output voltage of secondary windings is applied to CV electrode of CRT (picture tube) and performed convergence adjustment.

circuit diagram shown in Figure 17 is the theory of basic DCT circuit.

Figure 17

BLOCK DIAGRAM OF EB BOARD
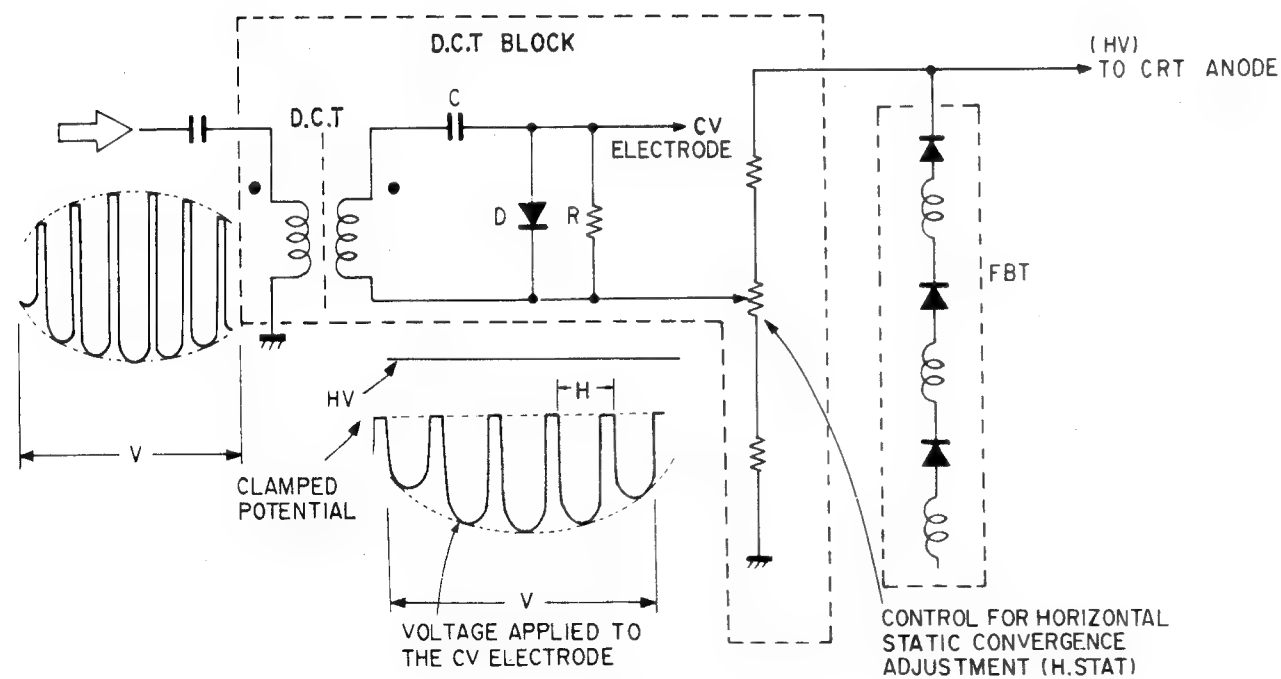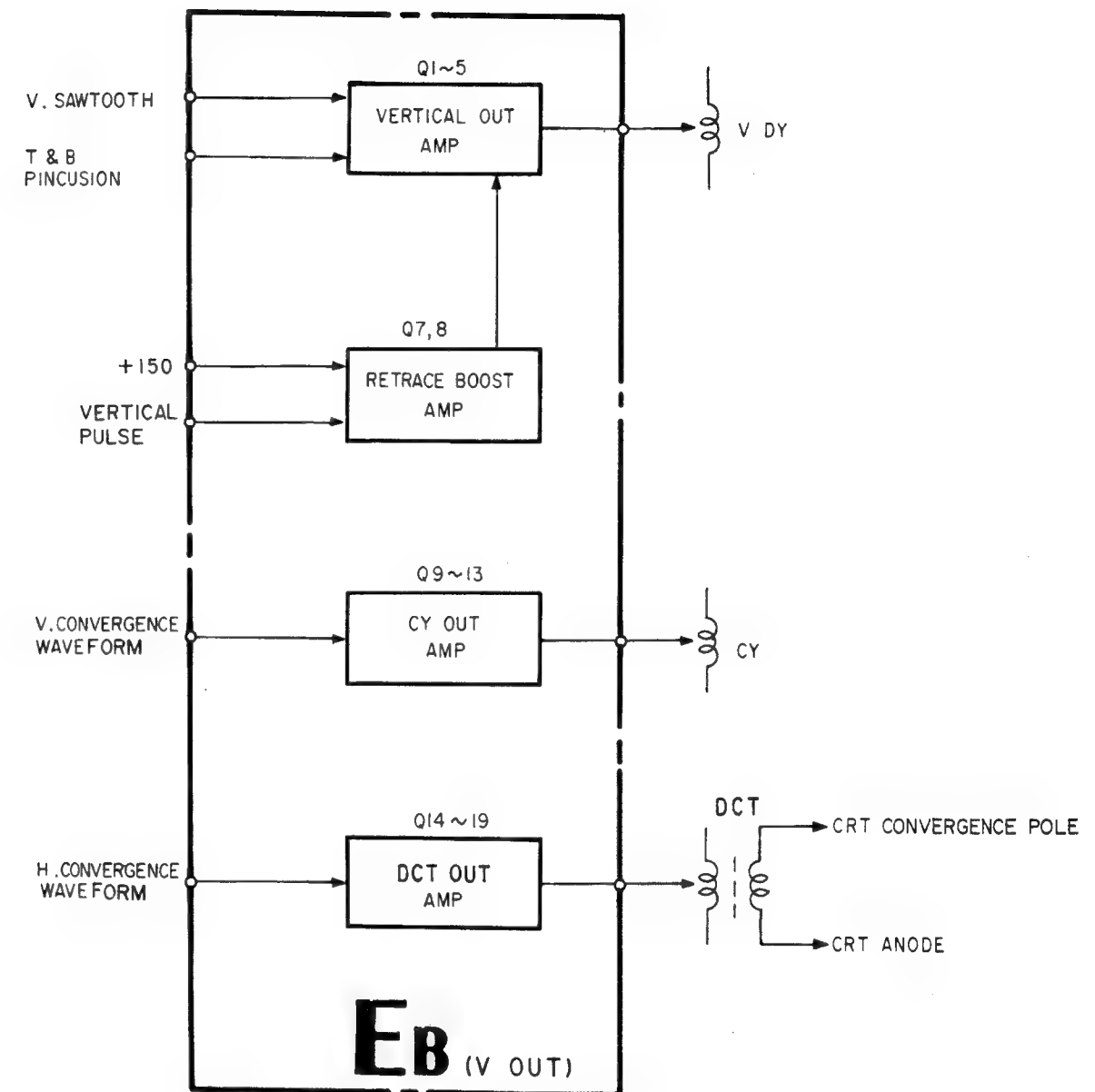
3-12. POWER SUPPLY CIRCUIT (GA, GB BOARDS)

3-12-1. AC Power Supply, Rectifier Circuit

Voltage selector located at the rear side of the unit should be selected to the local line voltage (AC 100/120V or 220/240V).
In case of AC 100/120V selected by voltage selector, rectifier D21 capacitors C80 and C81 operate as a double multiple rectifier.
See Figure 18(a).
In case of AC 220/240V selected by voltage selector, rectifier D21 capacitors C80 and C81 operate as a full-wave rectifier.
See Figure 18(b).
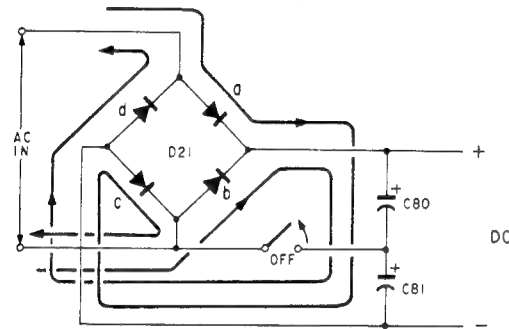
Figure 18(a)
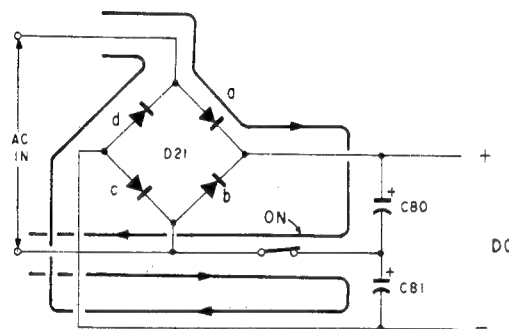
AC IN   Passes through D21d
and charges to C81.

Passes through D21a
and charges to C80.

Figure 18(b)

3-12-2. Degauss Circuit

There are 2 posistors (PTH1, PTH2) in the degaussing circuit. One is used for AC 100/120V operation, the other is for AC 220/240V operation, these posistors are switched by voltage selector.
This degaussing circuit is turned ON and OFF by using Relay (RY1) automatically.
When power is turned ON, Automatic degaussing starts to work and a few seconds later stops automatically.
Also Manual degaussing is available if necessary after a few minutes power is turned on when posistor (PTH1 or PTH2) gets cool down. This manual degaussing is operated by a push of button (Degauss Switch) at the left of the front panel.
When degaussing circuit starts to work, Q11 transistor turns on by time constant circuit composed of resistors R88, 91 and capacitor C74. Q11 drives Q12 transistor. Relay (RY1) is driven by Q12. Time constant circuit keeps degaussing circuit to activate for several seconds until degaussing is finished.
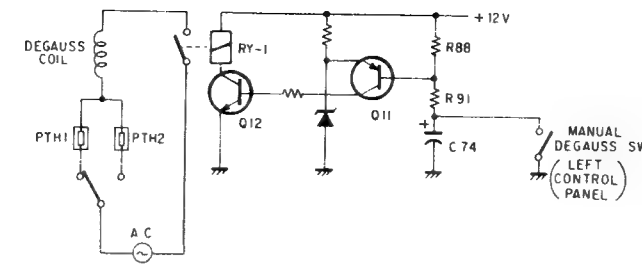
Figure 19

3-12-3. Starter Circuit

Blocking oscillator composed of IC1 and T4 starts working by turning the power on. DC output voltage of the rectifying-circuit, D7 and C57 in T4 secondary circuit, is supplied to the regulator-circuit IC (IC2 and IC3) with line voltage of 50 to 70V AC (at 110/120V AC) by function of the start-rectifying circuit (Q7, Q8, Q9). And the regulator circuit starts working and as +15V-line works, the voltage is supplied to the regulator-circuit IC through D20.
At the same time, a voltage for stopping the blocking-oscillator operation is provided to IC1 from the primary winding ⑥ –⑦ of the switching regulator transformer SRT2.

3-12-4. Switching Regulator Circuit

Block diagram is shown in Figure 20. This is half bridge type of switching regulator in this model.

Following Description is the Theory of Half-Bridge Switching Regulator.

DC voltage E_{IN} rectified from AC voltage in AC power rectifier section is divided by capacitor C1 and C2. C1 and C2 have almost same value. Q1 (contains 2 transistors) operates as a switch driven by PWM modulated pulse via T2 (Drive Transformer). Switching current flows through primary windings of T1 (SRT) by switching transistor Q1 via T3 (Current Transformer).
Thus output voltages are generated at secondary windings of T1.

Practical Circuit Used in this Model

There are 2 switching regulators in this power supply. One is for low voltage power supply, +15V, ±18V and +5V. The other is for high voltage +150V power supply.
Low voltages are generated by IC2, T1, T2, T3 and Q1.
High voltages are generated by IC3, T6, T7 and Q2.
Refer to block diagram
Current Transformer T3 and T7 detects excess current in transistor Q1 and Q2 for the protection of damage.
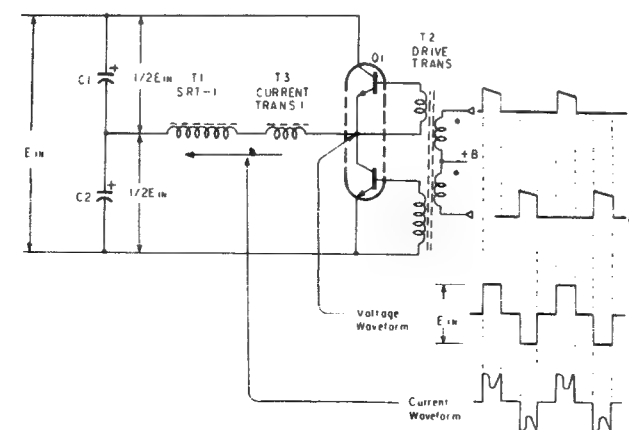
Figure 20

3-12-5. Over Voltage Protector

GB board, mounted on the GA board, is a protection circuit that when the output voltage surpasses the rated value for some reason, it makes short-circuit the CT (frequency-determination capacitor) on IC2 and IC3 and the regulator stops its operation to protect the circuits.

BLOCK DIAGRAM OF GA, GB BOARDS
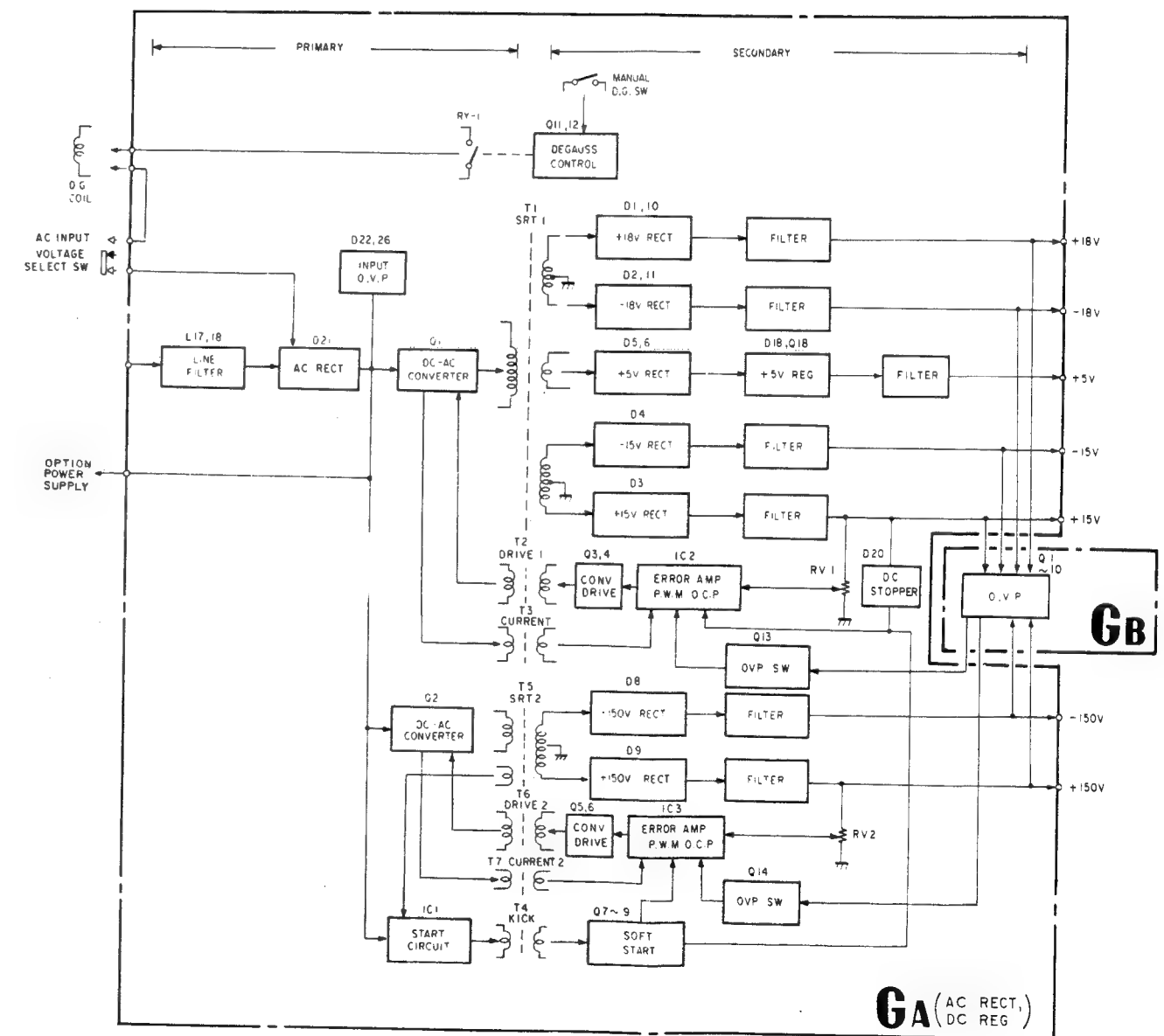
3-13. CONVERGENCE CIRCUIT
(DB, DC BOARDS, DCT BLOCK)

3-13-1. General Description

This is a simple explanation of the convergence system in Super fine Trinitron picture tube used in this model.

The Deflection Yoke (DY) used in this model generates an almost uniform magnetic field in order to get fine beam spot size. Accordingly basically misconvergence of horizontal direction as shown in Figure 21 is generated on the picture screen.

Horizontal misconvergence of Y axis direction   Horizontal misconvergence of X axis direction
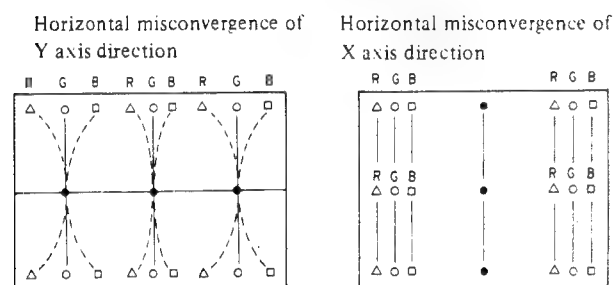
Figure 21

3-13-2. Static Electrorical Convergence System

Trinitron system has a unique static convergence system.

The structure of electric gun is shown in Figure 22.

G6 is the electrode for convergence. Static electrorical convergence control can be used. In this system beam spot deterioration is less than that of the electromagnetic system.
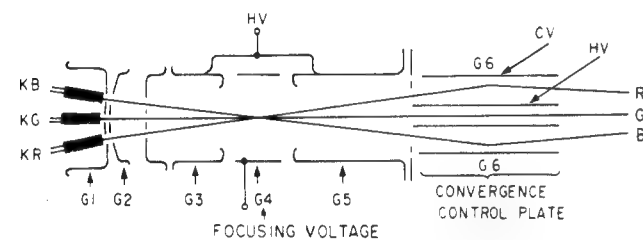
Figure 22

3-13-3. Convergence Correction Circuit
(Horizontal Convergence)

Misconvergence of horizontal direction on Y axis is corrected by applying vertical rate parabola waveform to the convergence plate (G6)

And misconvergence of horizontal direction is corrected by applying horizontal rate parabola waveform to G6.

See Figure 23.

HORIZONTAL MISCONVERGENCE
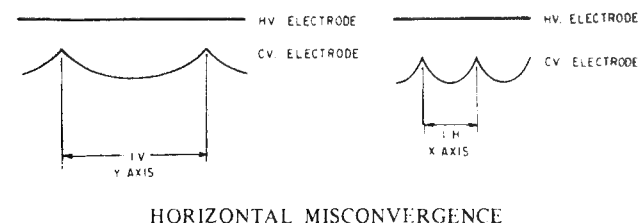
Figure 23

In this model, transformer is used to supply correction voltage to the G6 electrode for the horizontal direction misconvergence. In the secondary of the transformer peak clamp circuit using diode is applied so that both the vertical rate parabola waveform and horizontal rate parabola waveform are mixed and supplied to CV electrode. See Figure 24.
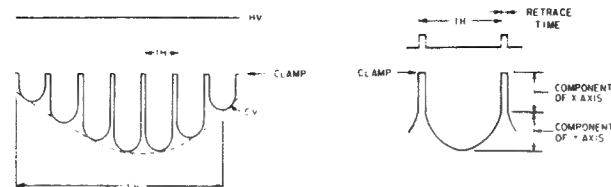
Figure 24

The correction waveforms are generated in DB board and output amplifier is located in EB board.

3-13-4. Vertical Convergence

Theoretically there is no misconvergence of Vertical direction since electric gun is aligned in line. But there is a slight amount of misconvergence due to the variations of CRT and DY and also due to the terrestial magnetism.

There are also 2 kinds of misconvergence of vertical direction on X axis and Y axis as same as hoirzontal direction.

Misconvergence of Vertical direction on X axis is corrected by CY (convergence yoke).

Figure 25 shows the CRT neck as seen from the rear side.

Red beam and Blue beam are moved to the vertical direction differentially by CY. As Green beam is at the center of the CRT neck, it is not affected by the magnetic field of CY due to the cancellation of the magnetic field at the center of the neck.

Misconvergence of vertical direction on Y axis is corrected by NTC (Neck Twist Coil).

A Neck Twist Coil is wound around the center of electrode G2 ~ G3 (See Figure 25) for the correction. Theortically, as the RED and Blue beams have HI component (They are opposite direction) as seen in Figure 25, they move to the vertical direction due to the magnetic field generated by NTC.

However as magnetic field of the NTC is the parallel to the Green beam, Green beam is not affected.

Correction waveform generator is located in DB board, output amplifier of CY is in EB board and output amplifier of NTC is in DB board.

Beam moving direction
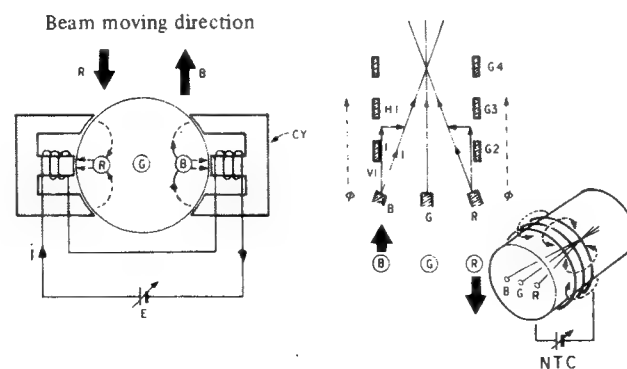
Figure 25

BLOCK DIAGRAM OF DB, DC BOARD
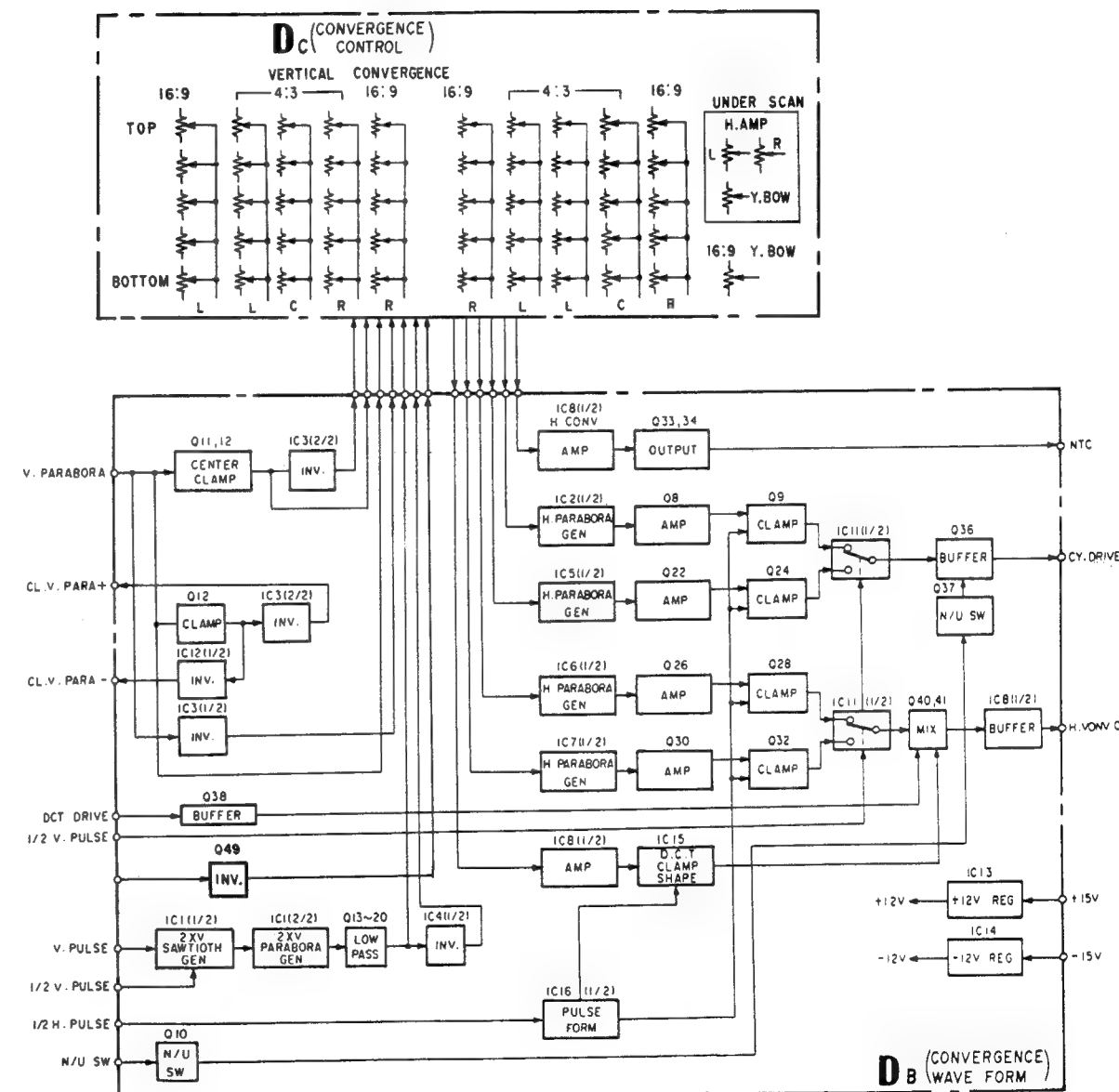
3-13-5. Convergence Correction Waveform Generator (DB BOARD)

This monitor incorporates unique convergence circuit which can adjust convergence at 15 positions of the picture screen, each 15 potentiometers for horizontal and vertical convergence adjustments are located on the left side of the drawer corresponding to the picture screen.

3-13-6. Horizontal Convergence Correction Waveform Generator

A vertical rate parabola waveform is supplied to the DB board from the DB board and is inverted and switched to make correction waveform.

For the left side of the picture screen, the correction waveform is compounded by adjusting potentiomerters RV16 ~ RV20 on the DC board. This waveform is converted to horizontal rate parabola waveform which level is proportional to the compounded waveform by H parabola generator (IC6, Q25). This is amplified by transistor Q26 and clamped at the center position of the horizontal period by transistor Q28 and IC6. See Figure 26.
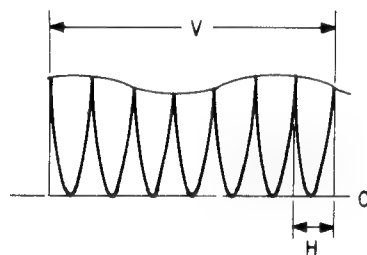
Figure 26

For the right side of the picture screen, the correction waveform is generated by adjusting potentiometers RV26 ~ RV30 on the DC board as same as the left side of the picture.
These correction waveforms (left and right side) are switched and mixed by analog switcher which activates at 1/2H period as seen in Figure 27.
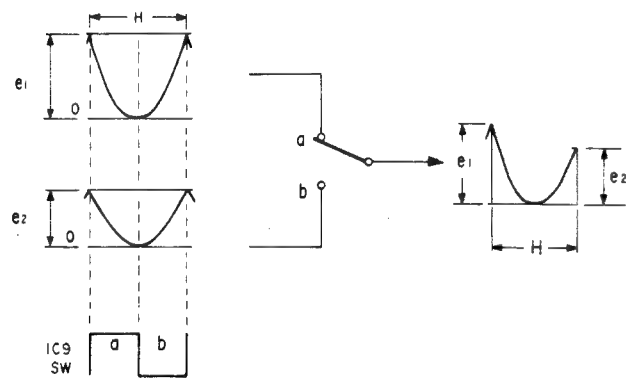
Figure 27

As a result, right side adjustments and left side adjustment can be performed independently of each other.
For the center of the picture screen, vertical parabola waveform is compounded to the correction waveform by adjusting potentiometers RV21 ~ 25 on the DC board, and converted to horizontal pulse. This means amplitude of horizontal pulse is modulated by vertical parobola. (Q40, Q41) See Figure 24.

This modulated pulse is mixed with horizontal parabola for left and right side correction. This mixed waveform is amplified and supplied to convergence plate in CRT via DCT. Thus horizontal covergence is corrected. See Figure 28.
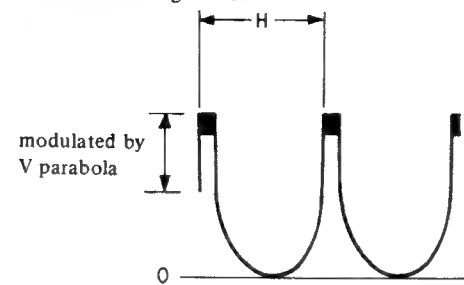
Figure 28
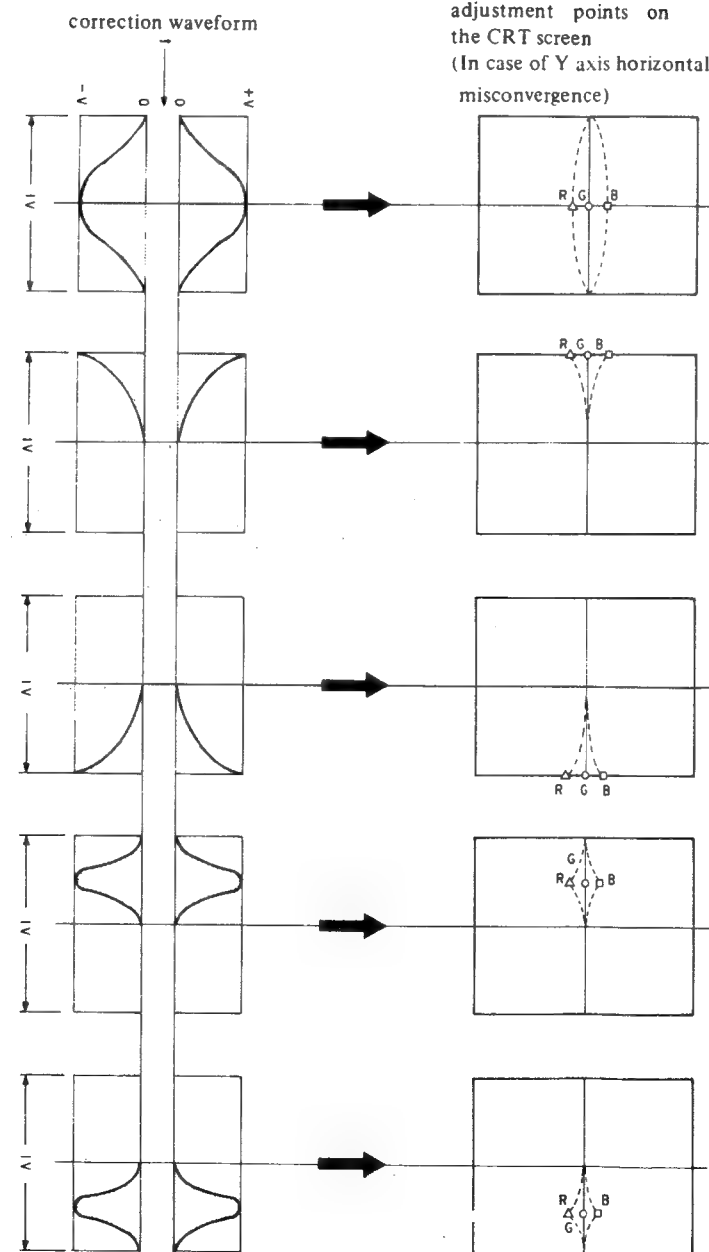
Figure 29

3-13-7. Vertical Convergence Correction Waveform Generator

For the left and right side of the picture, correction circuit for vertical convergence is same as horizontal correction circuit of left and right side of the picture. The correction waveform is amplified in EB board and supplied to CY.
For the center of picture screen, correction waveform is fed to amplifier (IC8 (1/2), Q33 Q34) and supplied to NTC (Neck twist Coil).
This vertical convergence is performed.

Diagram of correction waveform generation
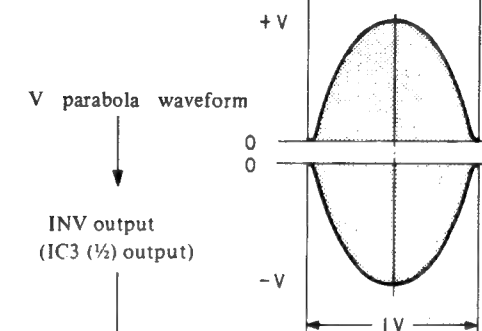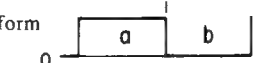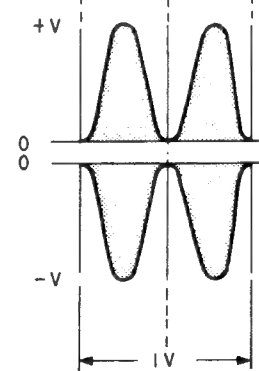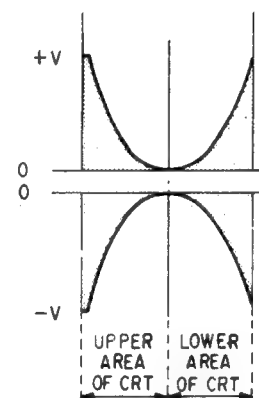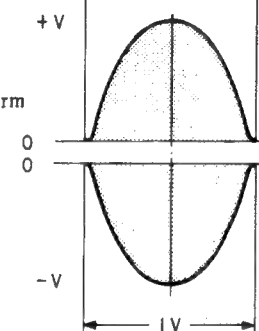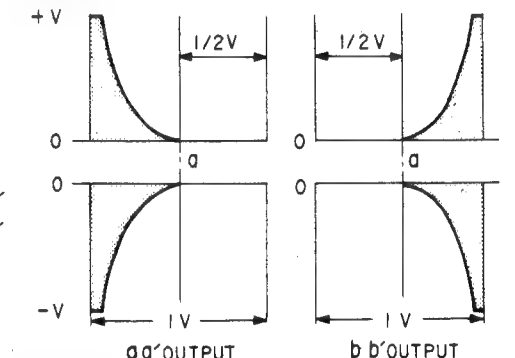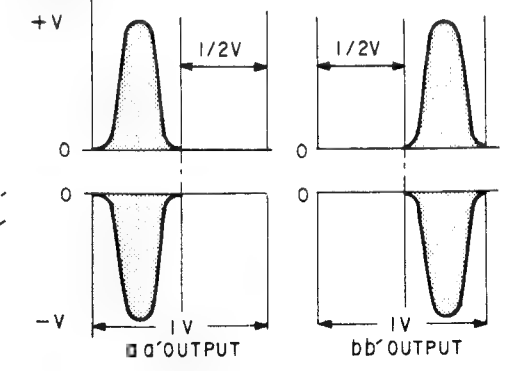
Figure 30

3-14. DEFLECTION CIRCUIT (DA BOARD)

3-14-1. H Delay and Horizontal AFC (Automatic Frequency Control) Circuit

In this model H delay function is performed by delaying H. AFC pulse in the horizontal AFC circuit. (See Figure 31)

H. AFC pulse which is fed from H.O.T. (Horizontal Output transformer) is wave shaped and is delayed about 20 μs by IC1 (2/2).

This delayed pulse is integrated by inductor L1, and capacitor C14, thus sawtooth waveform is obtained and fed to terminal pin ④ of IC4. AFC detection is performed by IC4. Output of AFC detector is fed to control terminal of horizontal oscillator (H.OSC) via low pass filter composed of capacitor C12, C15 and resistor R10.

3 types of AFC mode are selected by changing low pass filter which determines AFC time constant.

AFC time constant circuit is composed of switch S1, resistor R13, R14, R15 and capacitor C17, C18.

Pulse at H delay operation
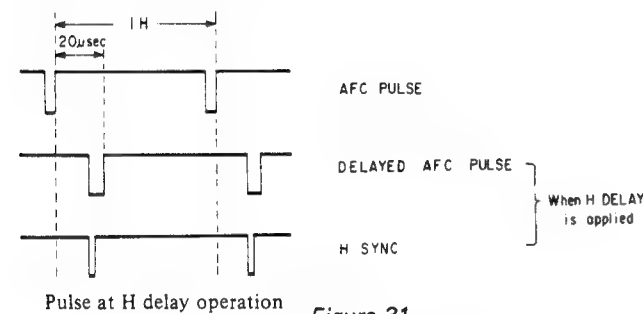
Figure 31

3-14-2. Horizontal Linearity Correction Circuit

In this model Horizontal Linearity correction is made by applying correction voltage to the Horizontal deflection circuit.

Basically, Linearity correction is made by modulating power source of horizontal output circuit with horizontal sawtooth voltage.

Also So-called "Inside pincushion" correction is performed by applying correction waveform to S correction capacitor.

This correction waveform is generated by balanced modulator (IC7) with vertical rate parabola waveform. See Figure 32.

Horizontal sawtooth waveform is generated by IC5 (1/2) for horizontal linearity correction. Horizontal rate parabola waveform is generated by integration of saw tooth by IC6 (1/2). This parabola waveform is performed balanced modulation by IC7 with vertical rate parabola waveform, horizontal sawtooh and parabola waveform are fed to horizontal linearity output amplifier in EA board. Correction of horizontal linearity correction and inside pincushion correction are performed.

Voltage of S correction capacitor
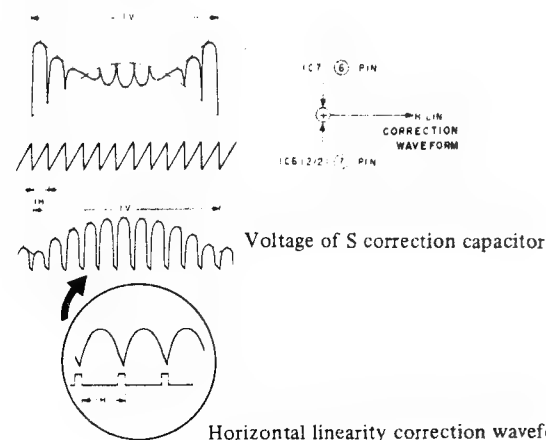
Horizontal linearity correction waveform

Figure 32

3-14-3. Horizontal Blanking Pulse Generator

Horizontal rate sawtooth waveform generated in H. Linearity circuit is fed to the comparator IC8 (1/2). In this circuit, 1/2H delayed pulse is obtained. This pulse is fed to integrator IC9 (1/2) and 1/2H delayed sawtooth waveform is obtained and this is fed to the comparator IC10 (1/2).

Thus the comparator generates horizontal pulse to make H. Blanking pulse wich starts just before the starting edge of the retrace time. Also width of horizontal blanking pulse is determined by JK-FF IC1 (1/2).
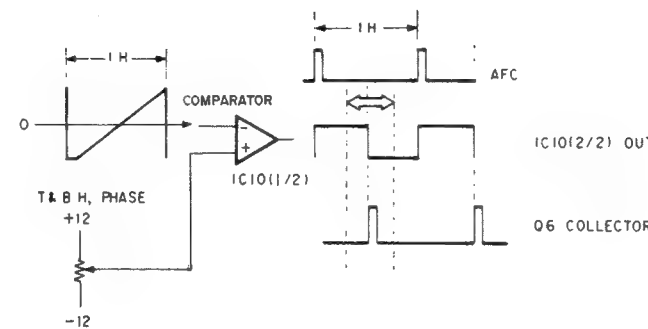
Figure 33

3-14-4. Top & Bottom Pincushion Circuit

Horizontal rate sawtooth waveform generated in H Linearity circuit is also fed to IC10. IC10 generates advanced H pulse for the phase correction because vertical Deflection Yoke works as an integrator at horizontal rate, and deflection current for Top & Bottom pincushion correction is delayed about 1/2H for this reason. See Figure 33.

Advanced H pulse is fed to IC11 (1/2) and advanced horizontal sawtooth waveform is generated. It is integrated by IC11 (2/2) and horizontal rate parabola waveform is obtained.

Modulated butterfly waveform for Top & Bottom pincushion correction is obtained by Balanced modulator IC12. In this balanced modulator, horizontal rate parabola waveform is used as a carrier and vertical rate sawtooth waveform is modulated by this carrier. See Figure 34.

This correction waveform is fed to vertical deflection output amplifier in EB board.
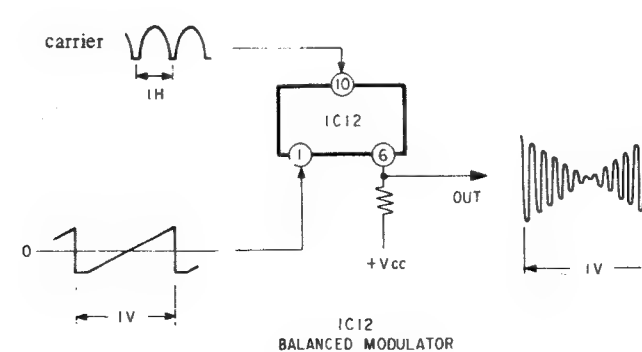
Figure 34

3-14-5. Autmatic 50/60Hz Field Selection Circuit

This model has an automatic vertical field frequency selection circuit so that color systems with different frequencies such as NTSC or PAL and SECAM can be received. IC18 is automatic field frequency detection device and its output switches (IC13) time constant of integrator in vertical deflection circuit.

3-14-6. Scan Mode Selection Circuit

There are 3 modes of scanning in this model: NORMAL SCAN/ UNDER SCAN/SET UP SCAN.

There are level adjustments for H1 width, V, height side pincushion and top & bottom pincushion.

Levels of correction waveforms are switched so that these adjustments are made independently for each scanning mode. IC14, IC15 and IC16 activates for this purpose.

3-14-7. Vertical Deflection, Side Pincushion Correction

IC19 (1/2) generates vertical rate sawtooth waveform for vertical deflection. V sawtooth waveform is generated by the integrator IC9 (1/2) which is reset by V sync.

Also vertical rate parabola is generated by integrating V. sawtooth waveform by IC9 (2/2).

This V parabola is used for side pincushion correction, and also V. parabola is converted to sine waveform by IC20 (1/2) and is mixed with V parabola waveform. This mixed waveform is used for side pincushion correction and fed to side pincushion output amplifier in EA board.

Vertical drive voltage for vertical deflection is generated by mixing vertical rate sawtooth waveform generated by IC19 (1/2) and sine waveform generated by IC22 (1/2).

This drive waveform is fed to vertical deflection output amplifier. Balance adjustment of vertical linearity correction can be performed by IC22 (1/2) and vertical centering can be adjusted by IC22 (2/2).
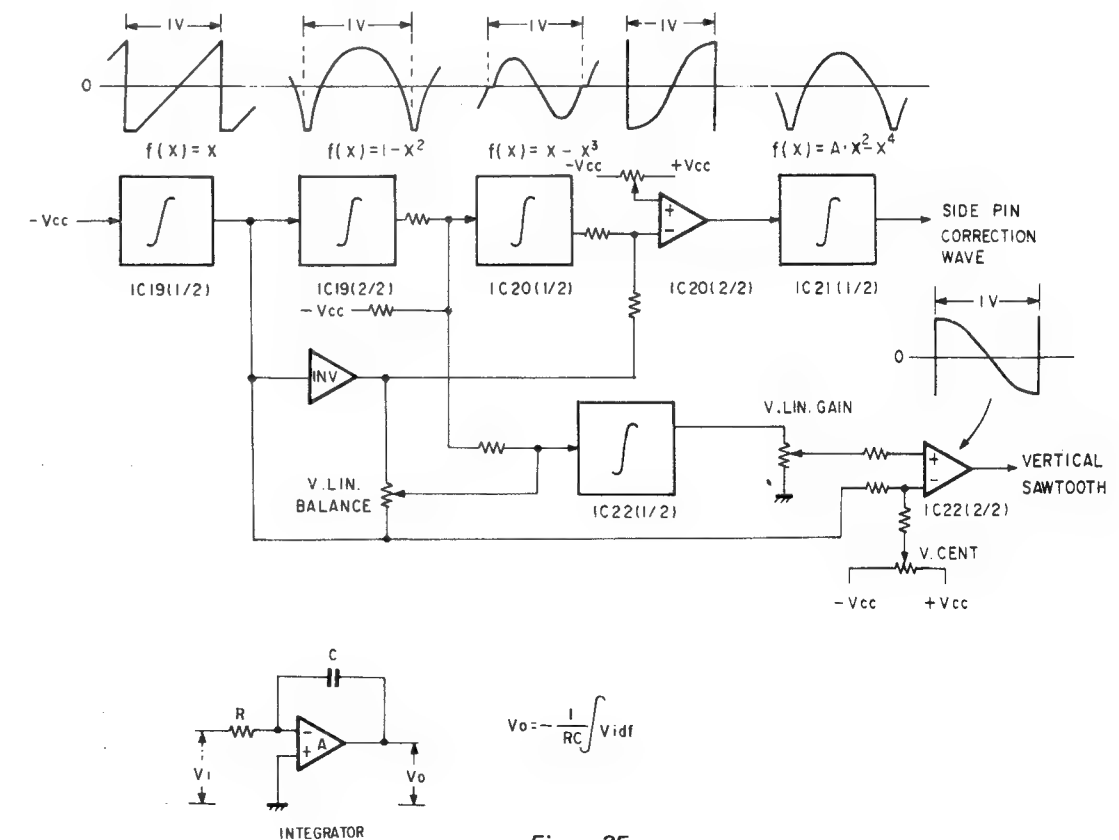
Figure 35

BLOCK DIAGRAM OF DA BOARD
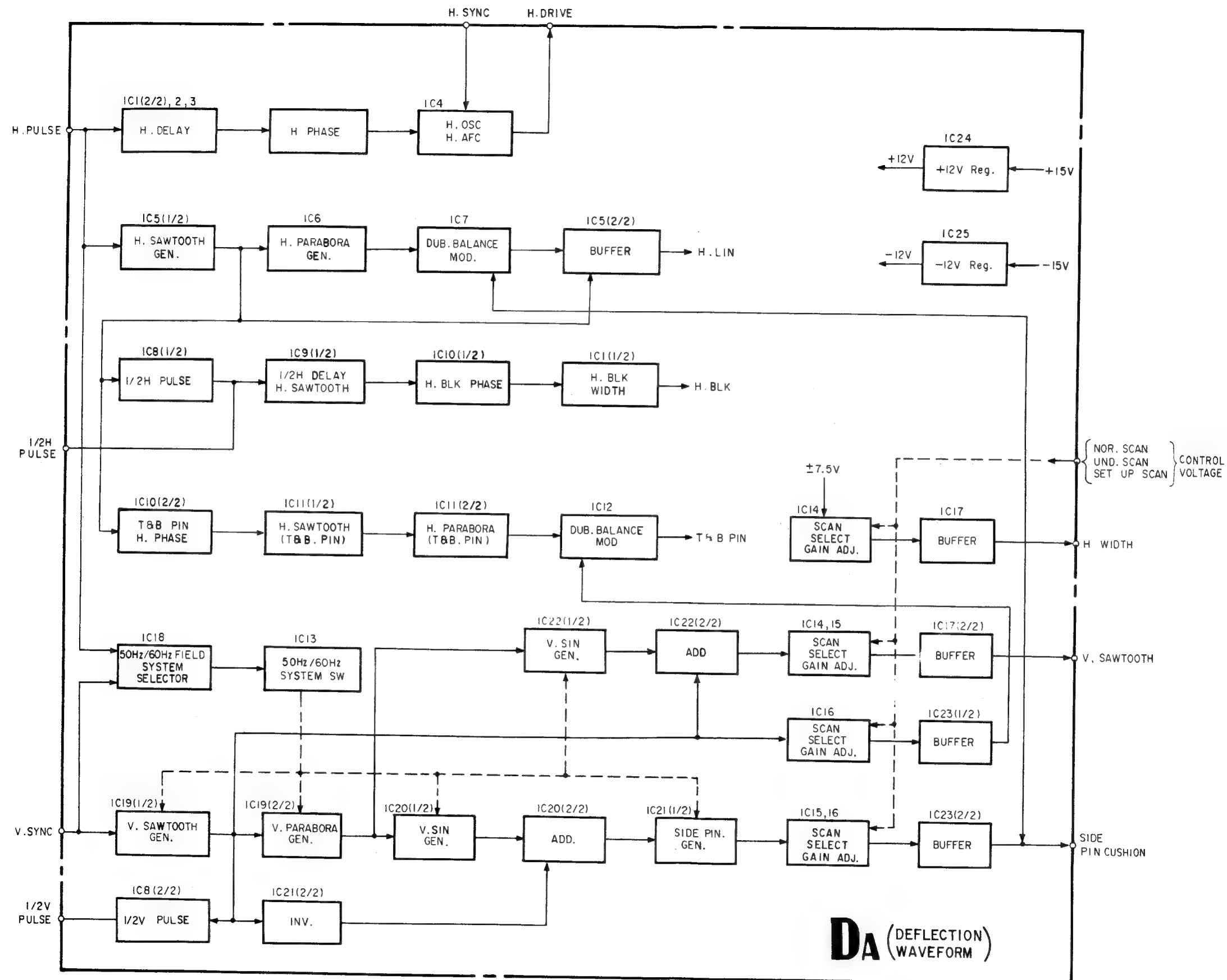
3-15. HORIZONTAL OUTPUT (EA BOARD)

3-15-1. Horizontal Deflection Circuit

Horizontal drive pulse for Horizontal deflection output is made at DA board and is fed to T4 (Horizontal Drive Transformer) via Q13 (H. driver). T4 is driven by Q13 and output pulse of T4 drives Q14 (Horizontal Output Transistor).

To obtain high efficiency in this model, DC-DC converter is used for side pincushion correction, Horizontal Width adjustment and +B Line voltage conversion to the horizontal deflection circuit.

This converted Line voltage is fed to horizontal deflection output circuit via H.O.T (Horizontal Output Transformer). Side pincushion correction and H. width adjustment are made by this DC-DC converter. IC1 contains error amplifier and PWM (Pulse Width Modulator) circuit for DC-DC converter. Side pincushion correction waveform and DC voltage for H. Width adjustment are made in DA board and supplied to error amplifier to control DC-DC converter.

3-15-2. Horizontal Centering Circuit

± low voltages power supply for H centering are made in this circuit from output of secondary windings of T5 (Horizontal Output Transformer). These low voltages are converted to current source for mixing DC current on the deflection current. In this circuit Bow shaped geometry distortion due to the H centering adjustment is adjusted by providing vertical rate parabola waveform current on the H centering current.

3-15-3. Horizontal Linearity Correction Circuit

Waveform for Horizontal Linearity correction made in DA board is fed to SEPP amplifier (Single Ended Push Pull) which are composed of Q1 - Q5 transistors. Output of this amplifier is fed to H deflection circuit (Deflection Yoke) and make correction of H linearity by T1 (Horizontal Linearity Transformer).

BLOCK DIAGRAM OF EA BOARD
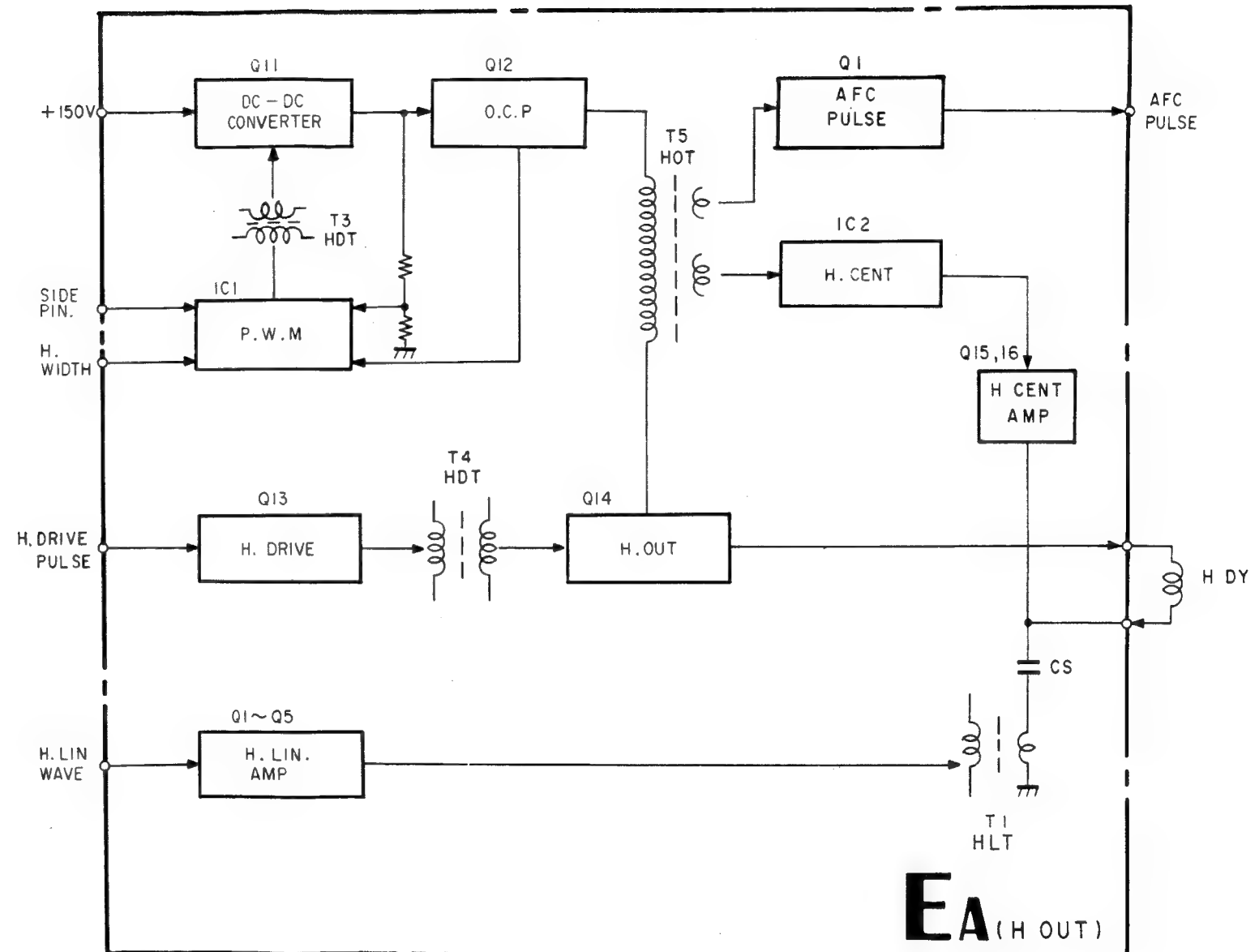
3-16. HIGH VOLTAGE REGULATOR (PA BOARD)

This high voltage regulator uses also DC-DC converter so as to reduce power consumption.
The theory of operation of this circuit is as follows.

3-16-1. Detection of High Voltage

High Voltage applied to the CRT anode is converted to the low voltage by DCT block (Dynamic Convergence Transformer). This low voltage is fed to buffer amplifier IC4(2/2) and compared with external reference voltage in IC1. The DCT contains resistor-network and transformer for convergence adjustment. This resistor-network works as a voltage divider.

3-16-2. PWM Modulator

IC1 works as error amplifier and PWM modulator comparing voltage between high voltage and the reference voltage is amplified and modulated so as to drive Q102 output transistor. Output signal from IC1, which is modulated in PWM, is fed to Q102 via drive transformer. +B line supplied to FBT (Fly Back Transformer) circuit is controlled by switching Q102 output transistor on/off.

3-16-3. Output Circuit

When high voltage drops down, output voltage of DCT also drops as above mentioned. At this time PWM circuit is designed so that the ON period of Q102 output transistor should be longer than high voltage drops down. +B line, switched ON/OFF by Q102, is supplied to converter circuit which drives FBT via LOT (Line Output Transformer).
Amount of collector current of Q103, which drives FBT, depends upon ON period of Q102 because PWM modulator is triggered by H. pulse. Therefore when ON period of Q102 is longer, collector current of Q103 increases and energy stored in capacitor C124 increases, causing potential of C124 to rise. (Refer to Figure 37) When output transistor Q103 goes off, flyback pulse is generated by resonance between capacitor C108 and inductance obtained by parallel connection of FBT and LOT. This flyback pulse is transferred to the secondary circuit of FBT. Therefore high voltage is generated.

3-16-4. High Voltage regulator

Q102, Q107, IC4 (2/2), IC1 (IC for controlling P.W.M) and HVR (DCT block) form a regulator.
Since the detection pin voltage of HVR is decreased when the high voltage is lowered due to increase of the CRT current, it makes the switch ON time length of Q102 longer. As a result, the collector peak current of Q103 is increased and accordingly, the energy accumulated in C124, which is fed to it through the FBT, is increased. In this way, it raises the potential of C124 and regulates the high voltage.
Q103, C108, C124 and the FBT form a high voltage converter circuit.
The pulse of on-duty 60% is generated with the H pulse by a time constant circuit which consists of Q109, Q110, Q111, Q112, R143, C128, R144, C127 and D111. When Q103 is switched OFF due to the on-duty 60% pulse, flyback pulse is generated at the collector of Q103 by resonating of the LOT, FBT and C108.

3-16-5. High Voltage Protection Circuit

High voltage protector activates to shut down high voltage, when high voltage exceeds the predetermined value so as to prevent Xray radiation.

The high voltage converted to the low voltage is detected at the terminal of DCT block. This detected voltage is fed to the + input terminal of comparator IC2(2/2) via low pass filter, which is composed of resistor R245 and capacitor C216. When this voltage exceeds the reference voltage, the voltage of ⊖ input terminal of comparator IC2(2/2), output level of this comparator goes high level and turns SCR (D206) gate on to shut down the drive pulse of flyback generator. Thus high voltage stops.
The reference voltage of the comparator IC2(2/2) is made by mixing stabilized voltage (zener diode D215)

3-16-6. Protection Circuit for Excess Beam Current

Beam current which flows in secondary windings of FBT is measured at the terminal 9 of FBT. This beam current is converted to the voltage by resistor R1 (R4) and R2 (R3), R5(R6) located in PB board in, series connection of secondary windings of FBT. This converted voltage is fed to ⊖ input of comparator IC2(1/2) or IC3(1/2). As beam current increases, ⊖input voltage goes down. When beam current increases until ⊖input voltage goes below the reference voltage (⊕ input terminal voltage) output voltage of comparator goes up high level and SCR (D205 or D206) turns ON. Thus drive pulse of flyback generator is shut down. Therefore high voltage stops.

3-16-7. CRT Protection Circuit

When vertical deflection stops, this circuit activates to shut down high voltage to prevent damage of CRT.
When vertical deflection stops, there is no vertical output pulse generated at vertical output amplifier. So Q201 transistor is cut off and output of comparator IC4(1/2) goes up high level. Q202 transistor turns on and flyback generator stops.

3-16-8. G2 Voltage Regulator

Flyback pulse generated at Q103 (HV output transistor) is rectified to obtain DC voltage. Q104 transistor which works in accordance with G2 control circuit in BI board supplied proper voltage to G2 of CRT.
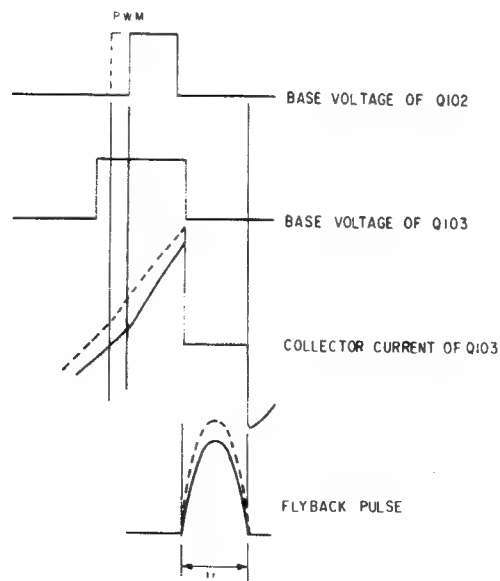
Figure 37
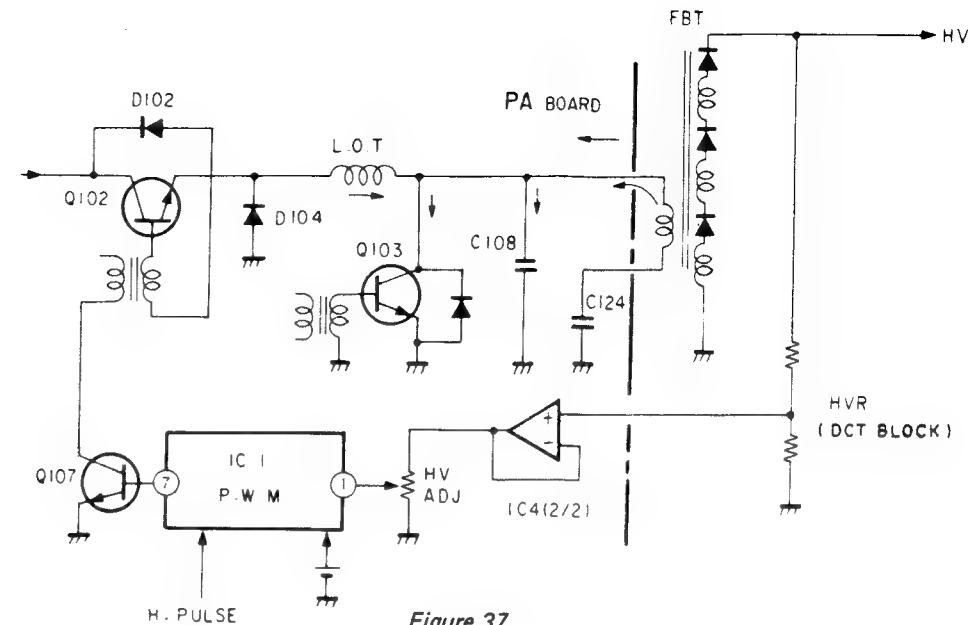
Figure 36

BLOCK DIAGRAM OF PA BOARD
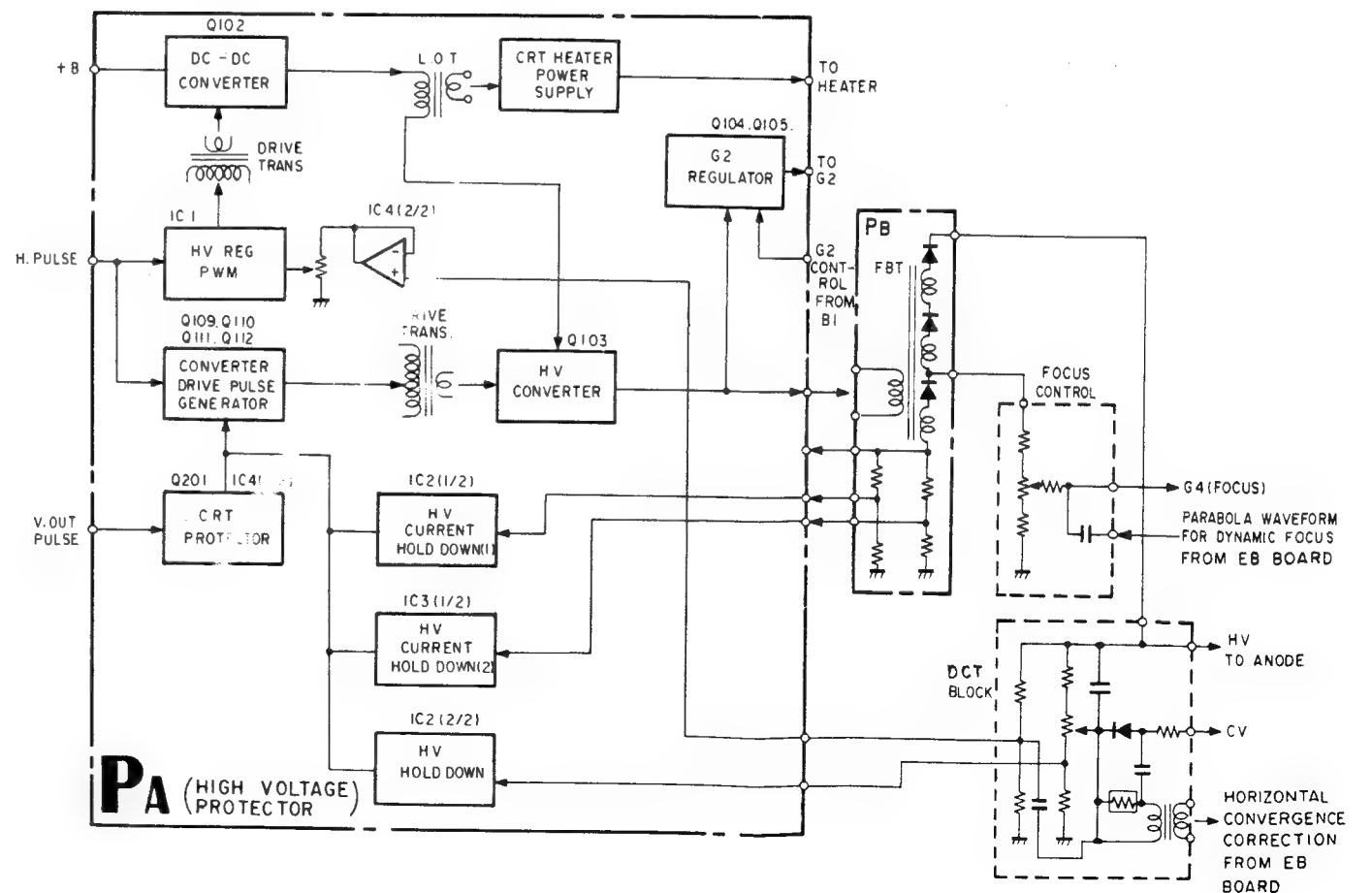
SECTION 4
ADJUSTMENTS

4-1. INTERNAL VIEW

High voltage resistor assembly (FOCUS)

High voltage block assembly. (H. STAT)

Neck assembly.

Flyback transformer assmbly.

Power voltage select switch.

10P connector "TALLY-REMOTE"

Fuse holder.

3P connector "AC IN"

Power supply block.

Neck assembly.

Deflection yoke, DY.

Power push switch (S901).
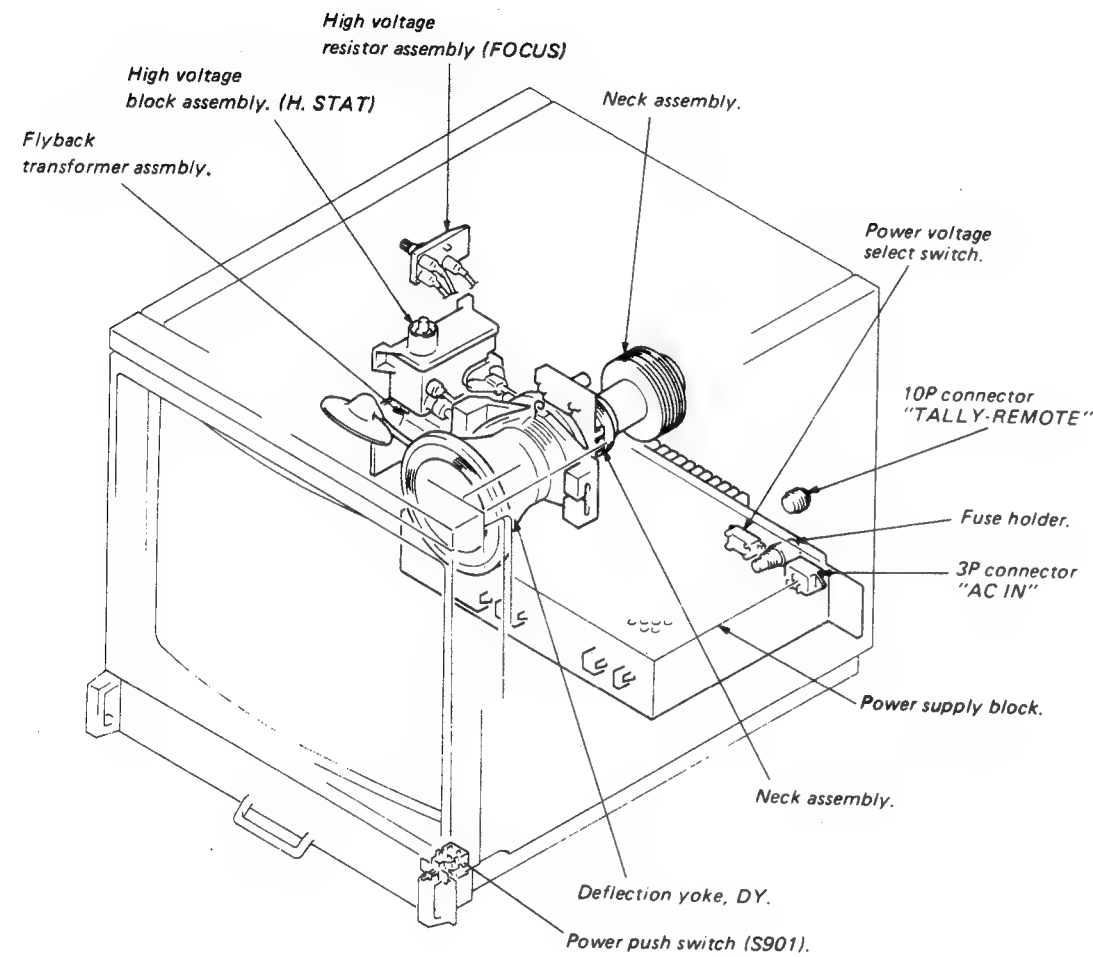
4-2. CIRCUIT BOARDS LOCATION

BT board
(BVM-1911 only)
(3 LINE DYNAMIC COMB FILTER, 2 LINE SIMPLE COMB FILTER, BPF)

BD board (BVM-2011P only)
(PAL DECODER Y. TRAP)
BC board (BVM-1911 only)
(NTSC DECODER Y, TRAP)

BG board
(COLOR GAIN CONTROL, COMPONENT R-Y AMP & DELAY, APERTURE CONTROL, DELAY, VECTOR OUT, NTSC MATRIX SW, G-Y MATRIX AMP)

BH board
(Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y-C MATRIX, CONTRAST /BRIGHTNESS CONTROL)

BI board
(DRIVE CONTROL, BEAM CURRENT CONTROL)

BJ board
(SYNC PROCESSING & PULSE GEN)

XB board
(TALLY)

GC board
(REG)

DC board
(CONVERGENCE CONTROL)

HY board
(CONTROL FUNCTION SELECT)

Y board
(POWER LED)

HX board
(INPUT SELECT)

HW board
(MANUAL CONTROL)

HH board
(MANUAL VOLUME)

HZ board
(SYSTEM CONTROL)

HA board
(PANEL CONTROL)

DA board
(DEFLECTION WAVEFORM)

DB board
(CONVERGENCE WAVEFORM)

GB board
(OVER VOLTAGE PROTECTOR)

PB board
(FBT)

GA board
(AC REG, DC REG)

EA board
(H OUT)

TA board
(MOTHER BOARD)

EB board
(V OUT)

PA board
(HIGH VOLTAGE PROTECTOR)

C board
(CRT SOCKET)

V board
(REMOTE)

BK board
(VIDEO OUT AMP)

W board
(RGB/COMPONENT)

QB board
(RGB/COMPONENT INPUT)

QA board
(COMPOSITE VIDEO INPUT)

BA board
(SYNC SELECT & SYNC SEP, HOOK UP)

TB board
(MOTHER BOARD)

4-3. QUICK REFERENCE

BOARD / SECTION	BA	BC	BD	BG	BH	BI	BJ	BK	BT	C	DA	DB
CIRCUIT DESCRIPTION	3-1	3-21	3-19	3-3	3-5	3-7 3-15	3-9	3-13 3-15	3-17	—	3-31	3-27
ADJUSTMENTS	4-23 4-27	4-33	4-63	4-23 4-29	4-23	—	4-21 4-32 4-46	4-47	4-49	—	4-78	—
BLOCK DIAGRAM	3-2	3-22	3-20	3-4	3-5	3-7	3-9	3-13	3-17	—	3-33	3-28
MOUNTING DIAGRAM	5-15	5-25	5-33	5-35	5-43	5-45	5-53	5-55	5-20	5-88	5-63	5-65
SCHEMATIC DIAGRAM	5-17	5-27	5-30	5-37	5-41	5-47	5-51	5-57	5-23	5-92	5-61	5-67
ELECTRICAL PARTS LIST	7-1	7-4	7-5	7-8	7-11	7-13	7-16	7-18	7-21	7-31	7-37	7-34

BOARD / SECTION	DC	EA	EB	GA	GB	GC	HA	HH	HW	HX	HY	HZ
CIRCUIT DESCRIPTION	3-27	3-35	3-23	3-25	3-25	—	—	—	—	—	—	—
ADJUSTMENTS	—	—	—	4-13	—	—	—	—	4-20	—	—	—
BLOCK DIAGRAM	3-28	3-36	3-24	3-26	3-26	—	—	—	—	—	—	—
MOUNTING DIAGRAM	5-73	5-76	5-77	5-83	5-82	5-105	5-95	5-95	5-95	5-96	5-97	5-101
SCHEMATIC DIAGRAM	5-70	5-79	5-79	5-85	5-86	5-107	5-94	5-93	5-93	5-93	5-93	5-99
ELECTRICAL PARTS LIST	7-32	7-40	7-33	7-26	7-31	7-25	7-46	7-42	7-42	7-42	7-42	7-44

BOARD / SECTION	PA	PB	QA	QB	TA	TB	V	W	XB	Y	Z	
CIRCUIT DESCRIPTION	3-37	3-37	3-1	3-1	—	—	—	—	—	—	—	
ADJUSTMENTS	4-15	—	—	—	—	—	—	—	—	—	—	
BLOCK DIAGRAM	3-38	3-38	3-2	3-2	—	—	—	—	—	—	—	
MOUNTING DIAGRAM	5-88	5-88	5-104	5-105	5-7	5-11	5-106	5-105	5-96	5-96	5-109	
SCHEMATIC DIAGRAM	5-91	5-92	5-107	5-107	5-9	5-13	5-107	5-108	5-94	5-94	—	
ELECTRICAL PARTS LIST	7-47	7-25	7-25	7-25	7-47	7-47	7-33	7-41	7-1	7-47	7-47	

4-4. SUB CONTROL PANEL LOCATION
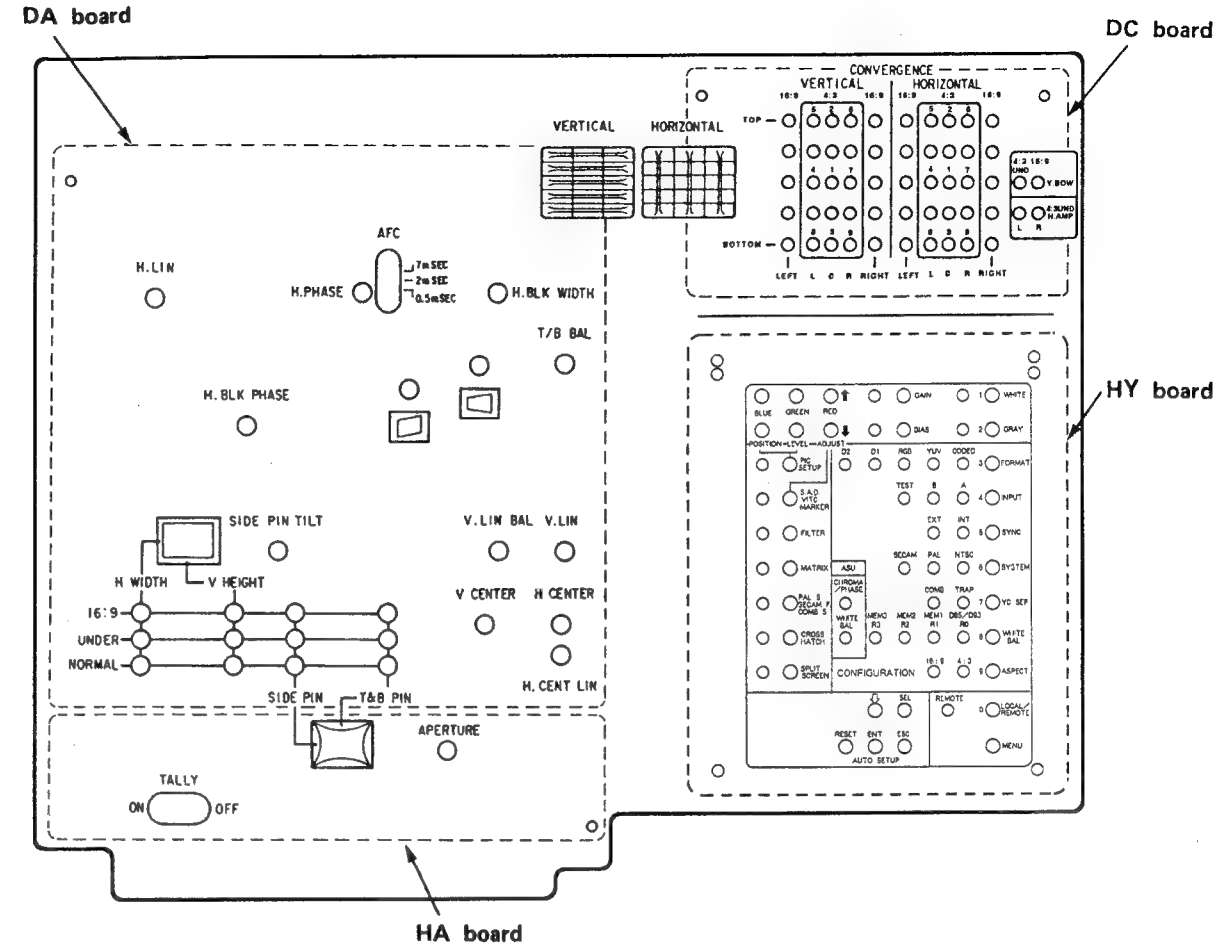
ADJUSTING METHOD OF DRAWER BLOCK

* Pull out sub-control panel and press two stopper buttons to drop it 60° as shown in the figure.

② Press two buttons.

① Pull out drawer.

③ Drop the drawer.
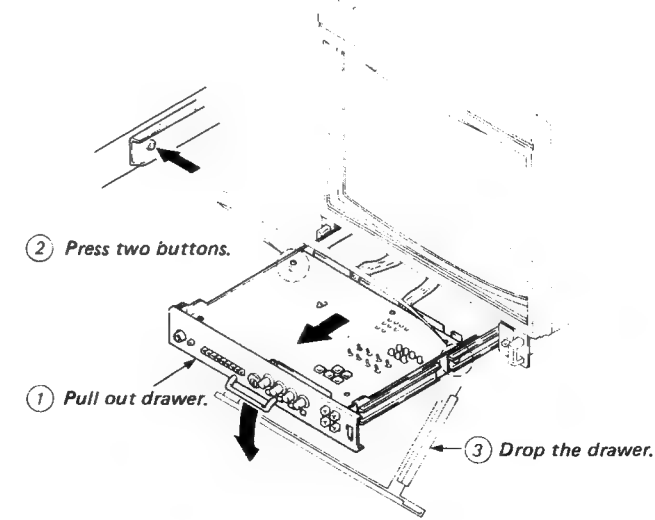
4-5. SETUP ADJUSTMENT IN CASE OF PICTURE TUBE REPLACEMENT

When the picture tube has been replaced, make the following adjustments. Convergence and white balance are normally adjusted by the potentiometers on the sub control panel.
(Refer to pages 4-6, 4-7, 4-8 and 4-9)

[Jigs Tools and Measurement Equipment Required]
1. SIGNAL GENERATOR (TEKTRONIX 1410 and 1411 Series)
2. COLOR ANALYZER
3. LUMINANCE METER

[Landing adjustment]
1. Connect signal generator and receive a white signal.
2. Set BRIGHTNESS and CONTRAST VRs to the preset position (□).
3. Face the CRT screen toward East (or West) and press the DEGAUSS switch.
4. Set the purity knob to mechanical center as shown in Fig.1-1.

Purity knob

Fig. 1-1.

5. Slide DY (Deflection Yoke) as far forward as possible.
6. Set the neck assembly in the position shown in Fig. 1-2.
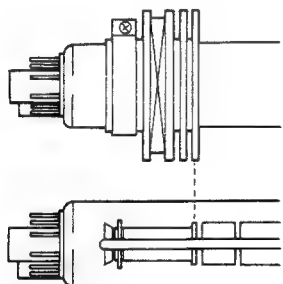
Fig. 1-2.

7. Set the screen to green only (R and B on the FRONT PANEL are in the IN position and G in the OUT position).
8. Turn purity knob as shown in Fig. 1-3 to bring the green on the center of the screen.
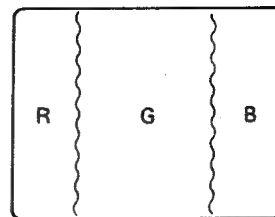
Fig. 1-3.

9. Slide DY back for uniform green raster.
10. Make the screen red only (G and B on the FRONT PANEL are in the IN position and R in the OUT position) and check landing.
11. Make the screen blue only (R and G on the FRONT PANEL are in the IN position and B in the OUT position) and check landing.
12. Adjust DY tilt and tighten DY set-screw.
13. Secure the DY with the spacers. (Fig. 1-4)

DY spacers
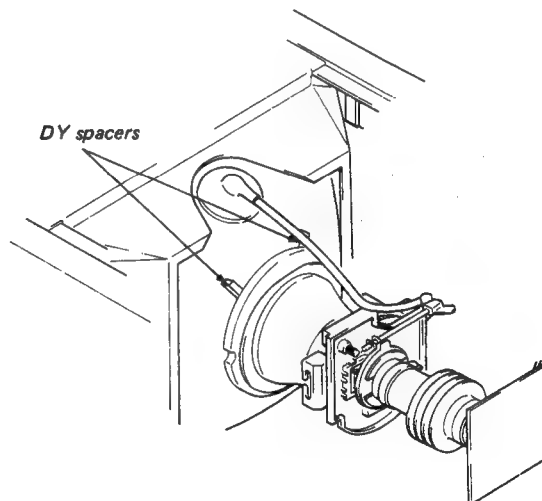
Fig. 1-4.

● **Final check**
After adjustments, check that there is no mislanding by facing the CRT towards East, West, North and South directions.

FRONT PANEL
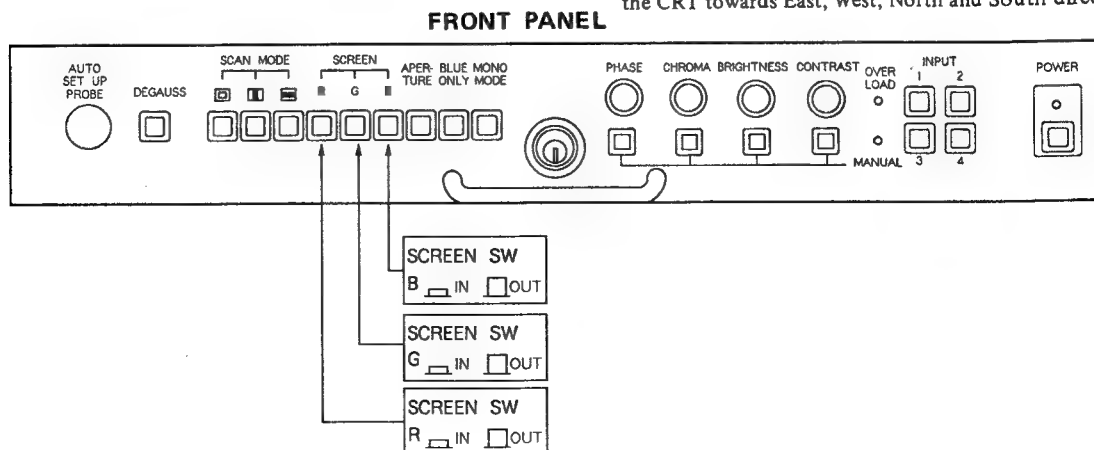
[Focus adjustment]
1. Connector signal generator (TEKTRONIX 1410 and 1411).
2. Input a dot or cross-hatch signals.
3. Adjust the FOCUS control for best focus in the central portion of the screen as shown in Fig. 1-5.
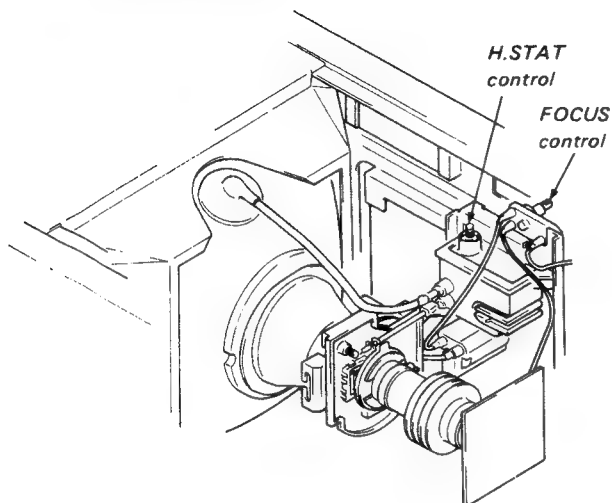
Fig. 1-5.

[Convergence Adjustment]
Preparation
1. Complete the signal generator connection and feed the dot and cross-hatch signals.
2. Set the CONTRAST and BRIGHTNESS controls at the points where the dots and the cross-hatch can be observed clearly.
3. Set the H. STATIC CENTER control (RV23) on the DC board to mechanical center as shown in Fig. 1-6.

DC board

RV8
V STATIC
CENTER

RV23
H STATIC
CENTER
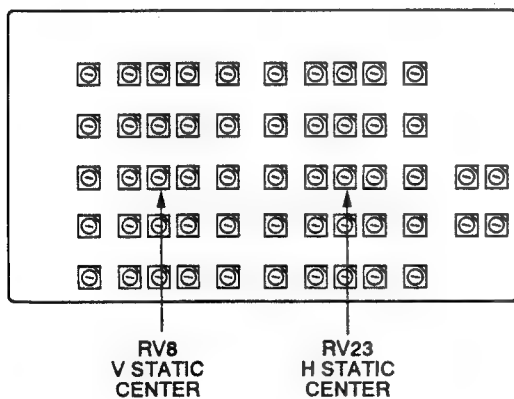
Mechanical center
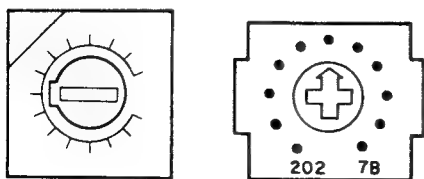
Fig. 1-6.

[Static Convergence]
● Horizontal Static Convergence
1. Adjust H. STAT control of DCT BLOCK to match the convergence of red and green in the horizontal direction at screen center.
2. Perform the HMC correction when blue is out of convergence in the same direction on all over the screen.
3. Move the BMC magnet to correct H. static convergence as shown in Fig. 1-7.
● Vertical Static Convergnce
1. Adjust the V. STATIC CENTER (RV8) on the DC board to match the convergence of red and green in the vertical direction at screen center.
2. When blue is out of the convergence in the same direction all over the screen, perform the VMC correction.
3. Move the BMC magnet to correct static convergence as shown in Fig. 1-7.

BMC Magnet
(Hexapole)
Magnet
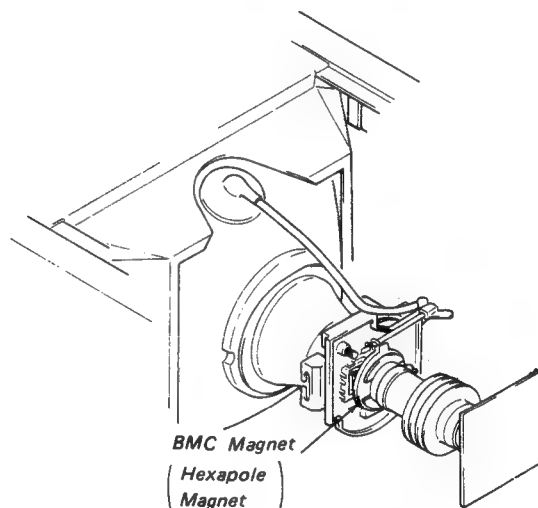
Fig. 1-7.

● HMC and VMC correction for BMC Magnet.
1. HMC (Horizontal, Mis, convergence) correction and motion of the Electron Beam with the Hexapole Magnet.
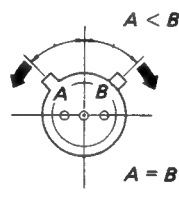
HMC correction (A)   HMC correction (B)
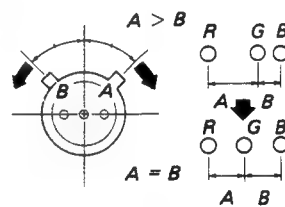
Fig. 1-8.

2. VMC (Vertical, Mis, convergence) correction and motion of the Electron Beam with the Hexapole Magnet.
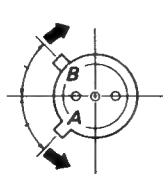
VMC correction (A)   VMC correction (B)
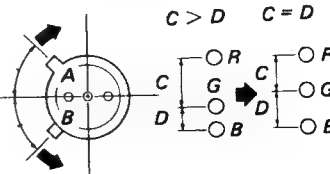
Fig. 1-9.

[DYNAMIC CONVERGENCE]

● Convergence adjustment of 4:3 aspect picture.

1. ASPECT button on the HY board ······························4:3
2. Adjust CONVERGENCE controls (RV1 ~ RV30) on the DC board as shown in Fig. 1-10.
3. It can be adjusted as Red and Blue move in symmetry to the Green. (Green does not move)
4. Adjust the convergence corresponding to the portion of the screen as follows.
5. Always match the convergence in the order of center → on Y axis → on X axis → corner against the screen.

DC board

V.CONVERGENCE H.CONVERGENCE

TOP
MIDDLE
CENTER
MIDDLE
BOTTOM

V. CONVERGENCE   H. CONVERGENCE

16:9   4:3   16:9   16:9   4:3   16:9

RV1 RV6 RV11   RV16 RV21 RV26

RV2 RV7 RV12   RV17 RV22 RV27   4:3 16:9

RV3 RV8 RV13   RV18 RV23 RV28   RV31

RV4 RV9 RV14   RV19 RV24 RV29   RV32 RV33

RV5 RV10 RV15   RV20 RV25 RV30
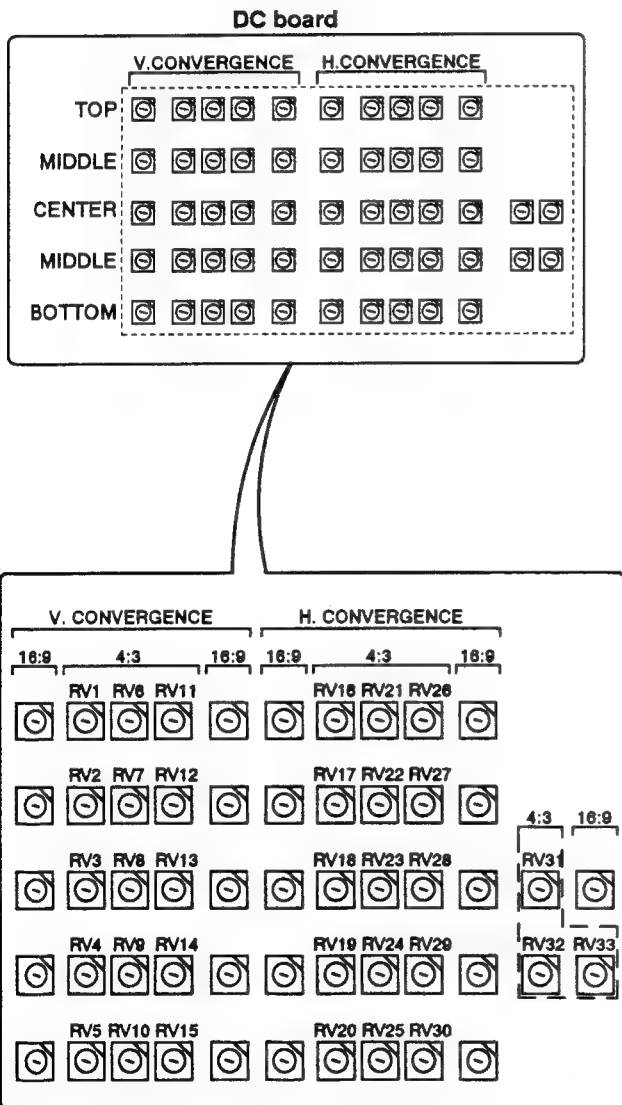
Fig. 1-10.

[CONVERGENCE PROCESS]

1. UNDER SCAN switch ·················· NOR (□)
2. Adjust RV23 and RV8 on the DC board to coincide with R, G and B dots at the center of the screen as shown in Fig. 1-11.

RV8   RV23
R
G   RGB
B
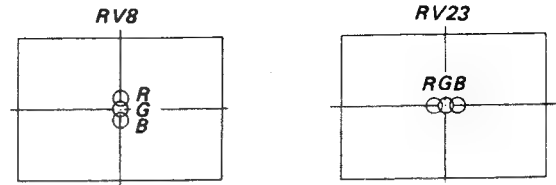
Fig. 1-11.

3. Adjust RV6, RV10, RV21 and RV25 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-12.

RV6   RV21
R   RGB
G
B

R   RGB
G
B
RV10   RV25
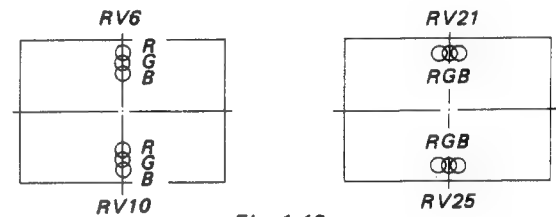
Fig. 1-12.

4. Adjust RV3, RV13 and RV18, RV28 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-13.

RV18   RV28
RV3 R   R RV13   RGB   RGB
G   G
B   B
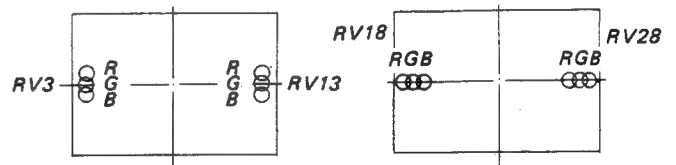
Fig. 1-13.

5. Adjust RV1, RV5 and RV11, RV15 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-14.

RV1 R   R RV11
G   G
B   B

RV5 R   R RV15
G   G
B   B
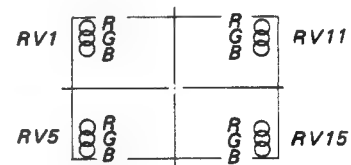
Fig. 1-14.

6. Adjust RV16, RV20 and RV26, RV30 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-15.

RV16   RV26
RGB   RGB

RGB   RGB
RV20   RV30
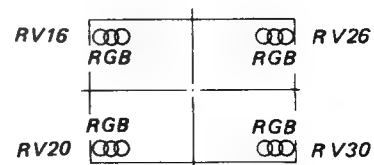
Fig. 1-15.

7. Adjust RV7, RV9 and RV22, RV24 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-16.
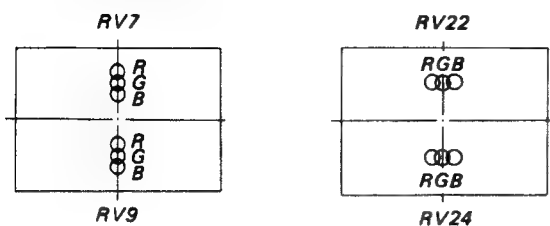
Fig. 1-16.

8. Adjust RV2, RV4 and RV12, RV14 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-17.
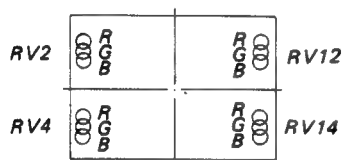
Fig. 1-17.

9. Adjust RV17, RV19 and RV27, RV29 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-18.
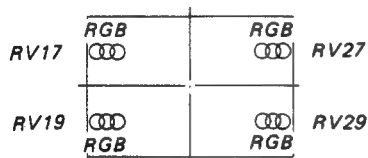
Fig. 1-18.

10. UNEDR SCAN switch . . . . UNDER (⌐)
11. Adjust RV31 (UNDER SCAN Y. BOW) on the DC board to coincide with the R, G and B dots as shown in Fig. 1-19.
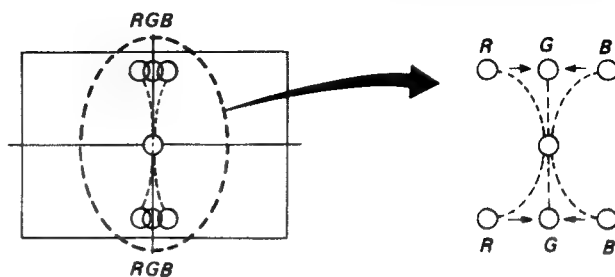
Fig. 1-19.

12. Adjust RV32 and RV33 (UNDER SCAN H. AMP) on the DC board to coincide with the R, G and B dots as shown in Fig. 1-20.
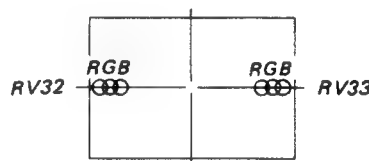
Fig. 1-20.

SUB CONTROL PANEL (HY board)
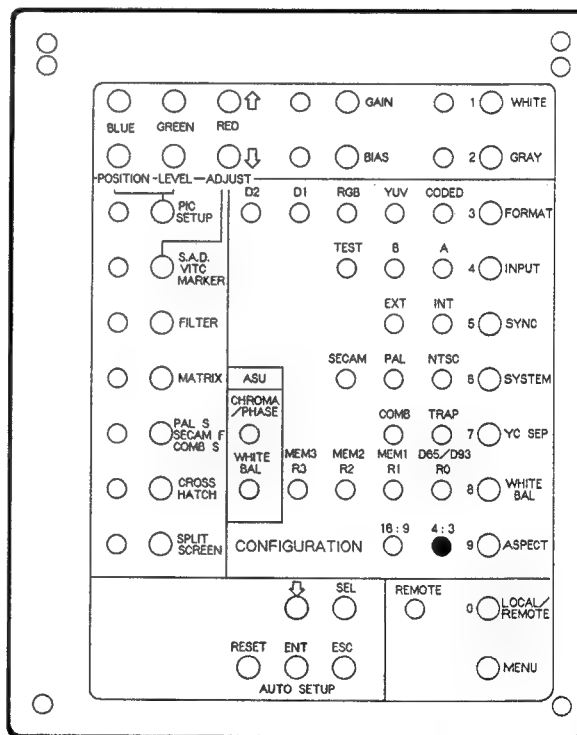
FRONT PANEL
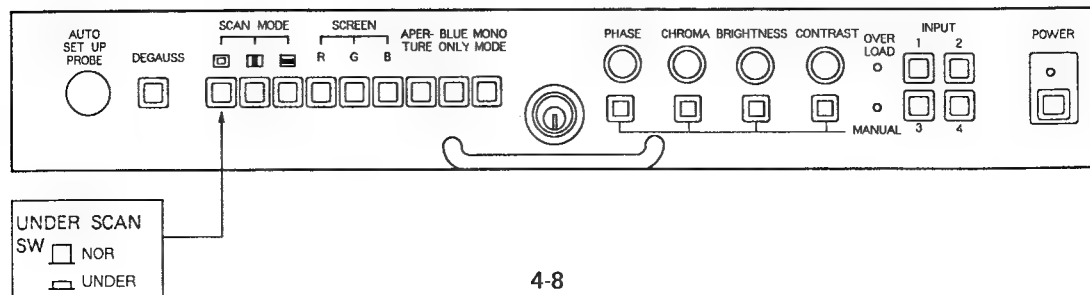
● Convergence adjustment of 16:9 aspect picture.

1. ASPECT button on the HY board ·····························16:9
2. Adjust CONVERGENCE controls (RV41 ~ RV60) on the DC board as shown in Fig, 1-21.
3. It can be adjusted as Red and Blue move in symmetry to the Green. (Green does not move)
4. Adjust the convergence corresponding to the portion of the screen as follows.
5. Always match the convergence in the order of center → on Y axis → on X axis → corner against the screen.
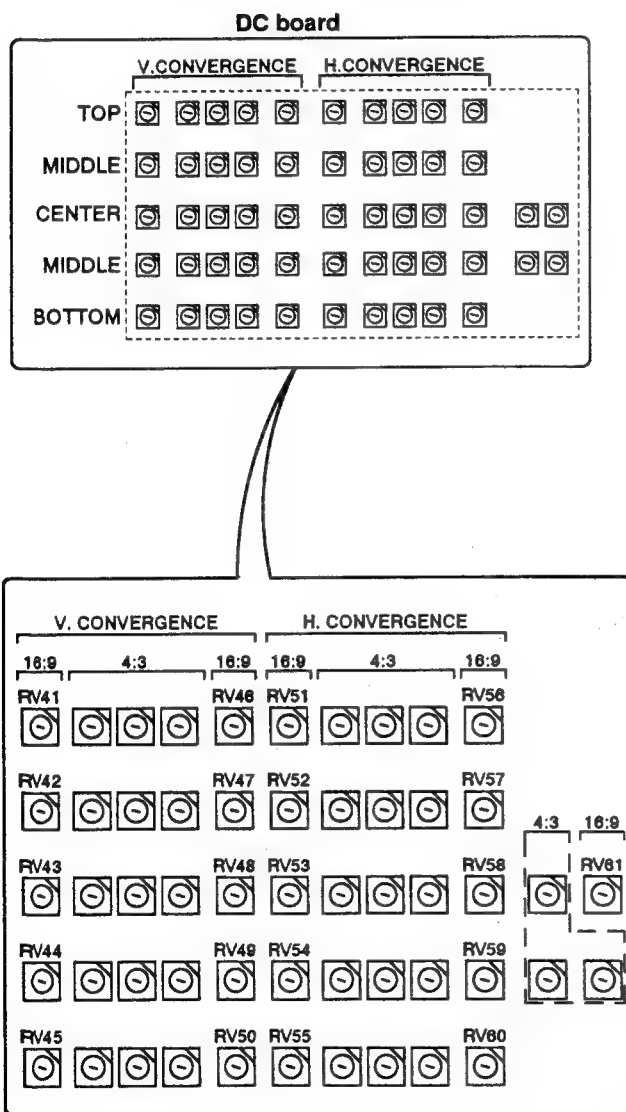
DC board

Fig. 1-21

[CONVERGENCE PROCESS]

1. UNDER SCAN switch . . . . NOR (冖)
2. Adjust RV43, RV48 and RV53, RV58 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-22.
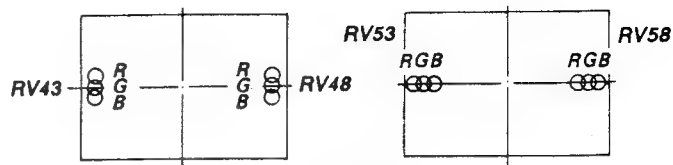
Fig. 1-22

3. Adjust RV41, RV45 and RV46, RV50 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-23.

Fig. 1-23.

4-9
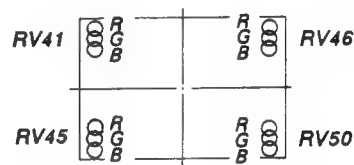
4. Adjust RV51, RV55 and RV56, RV60 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-24.

RV51 ⟨⟨⟩⟩ RGB   ⟨⟨⟩⟩ RGB RV56

RGB ⟨⟨⟩⟩   RGB ⟨⟨⟩⟩
RV55   RV60

Fig. 1-24.

5. Adjust RV42, RV44 and RV47, RV49 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-25.

RV42   R G B   R G B   RV47

RV44   R G B   R G B   RV49

Fig. 1-25.

6. Adjust RV52, RV54 and RV57, RV59 on the DC board to coincide with the R, G and B dots as shown in Fig. 1-26.

RGB   RGB
RV52 ⟨⟨⟩⟩   ⟨⟨⟩⟩ RV57

RV54 ⟨⟨⟩⟩   ⟨⟨⟩⟩ RV59
RGB   RGB

Fig. 1-26.

7. Adjust RV61 (Y. BOW) on the DC board to coincide with the R, G and B dots as shown in Fig. 1-27.

RGB

RGB

Fig. 1-27.

FRONT PANEL

AUTO SET UP PROBE   DEGAUSS   SCAN MODE   SCREEN R G B   APER-TURE   BLUE ONLY   MONO MODE   PHASE   CHROMA   BRIGHTNESS   CONTRAST   OVER LOAD   INPUT 1 2   POWER

MANUAL 3 4

UNDER SCAN SW ☐ NOR ▢ UNDER

SUB CONTROL PANEL (HY board)

BLUE   GREEN   RED   GAIN   1 WHITE

                          BIAS   2 GRAY

POSITION-LEVEL—ADJUST
        D2 D1 RGB YUV CODED
PIC SETUP   3 FORMAT

                    TEST B A
S.A.D. VITC MARKER   4 INPUT

                    EXT INT
FILTER   5 SYNC

                SECAM PAL NTSC
MATRIX ASU   6 SYSTEM

CHROMA /PHASE   COMB TRAP
PAL S SECAM F COMB S   7 YC SEP

WHITE BAL MEM3 MEM2 MEM1 D65/D93
CROSS HATCH R3 R2 R1 R0   8 WHITE BAL

                16:9 4:3
SPLIT SCREEN CONFIGURATION   9 ASPECT

            SEL   REMOTE
                          0 LOCAL/REMOTE

RESET ENT ESC
                          MENU
AUTO SETUP

4-10

WHITE BALANCE ADJUSTMENT

100% white signal

Tektronix 1410 (NTSC)/1411 (PAL)

VIDEO A terminal

75Ω terminator

HY board

SUB CONTROL PANEL (HY board)

FRONT PANEL

1. Input 100% white signal to VIDEO A connector.
2. Gray button .... ON
3. BRIGHTNESS MANUAL switch .... MANUAL. (⌐)
   CONTRAST MANUAL switch .... MANUAL. (⌐)
4. Turn BRIGHT and CONTRAST to become 100 with PRESET MENU.
   SAVE the DATA.
5. Switch off the MANUAL swithes of CONTRAST and BRIGHT.
6. Turn BIAS controls (S21:Red, S23:Green, S32:Blue) on the HY board to adjust the BRIGHTNESS to 0.5NIT and white balanc using COLOR ANALYZER and check 0.5NIT by LUMINANCE METER.
7. White button .... ON
8. Turn GAIN controls (S20:Red, S22:Green, S31:Blue) on The HY board to adjust the BRITHNESS at HIGH LIGHT to 103 NIT and white balance using COLOR ANALYZER and check 103 NIT by LUMINANCE METER.
9. Repeat procedure staps 6 to 8 if necessary.

4-11
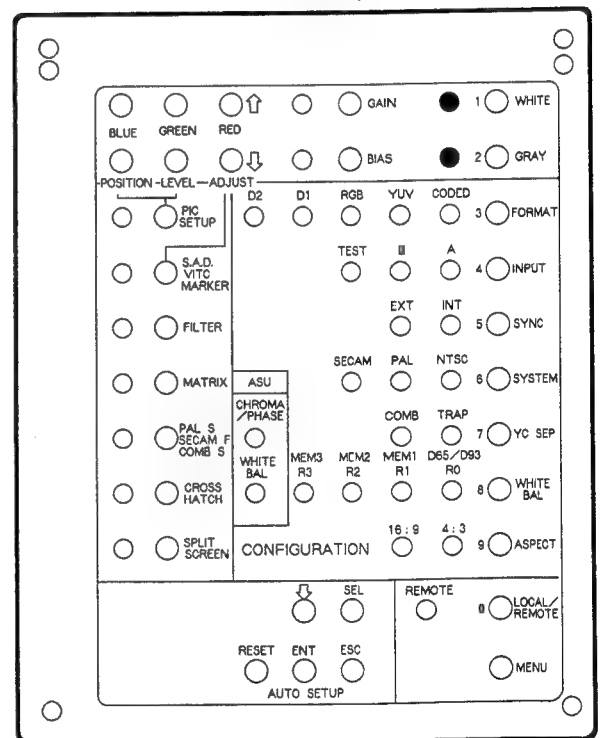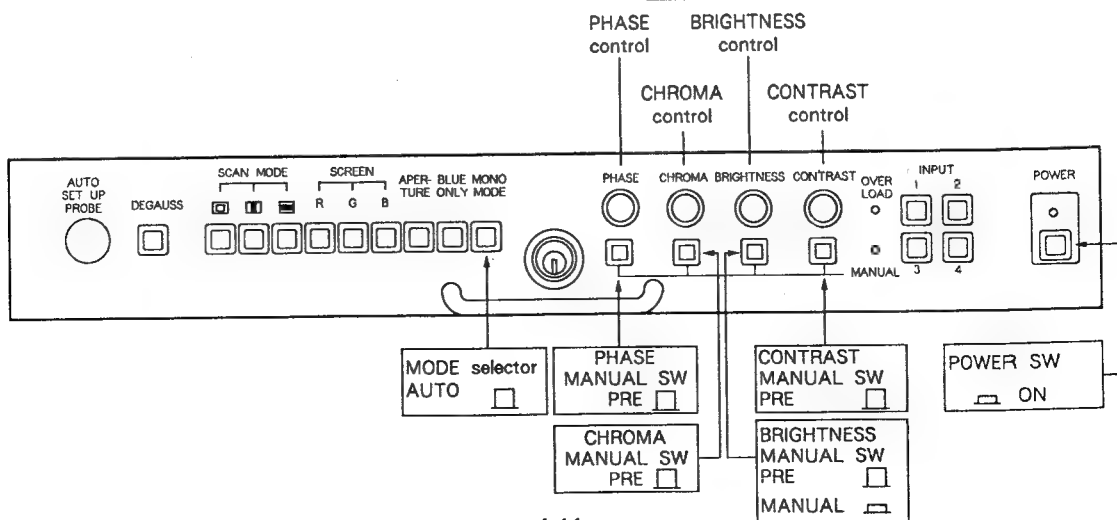
B+ PROTECTOR (☒R52, R53)

When replacing the following components (marked ☑ on the schematic diagram), make this confirmation.

☑ GA Board .. Q13, Q14, R52, R53
   GB Board .. D5, D6, D7, D8, Q3, Q4, Q5, R4, R5, R19, R20, R21, R22

It is necessary to use a digital multimeter for this confirmation.
Connect a digital multimeter to TP2 on GA Board.

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (manual button is out ⎍)
2. Short-circuit R55 on GA Board.
3. Connect a 100kΩ variable resistor between TP4 and TP3 (GND) on GA board.
4. Confirm that the reading on the digital multimeter drops abruptly from +182.0V ~ +216.0V to 0V by turning the 100kΩ variable resistor so that the value of the resistor decrease from maximum value.
5. If step 4 isn't satisfied, select resistance values of R52 and R53 which satisfy the specifications.
6. Restore these to their original states and confirm that the voltage at TP2 is 150.0 ±1.0V.
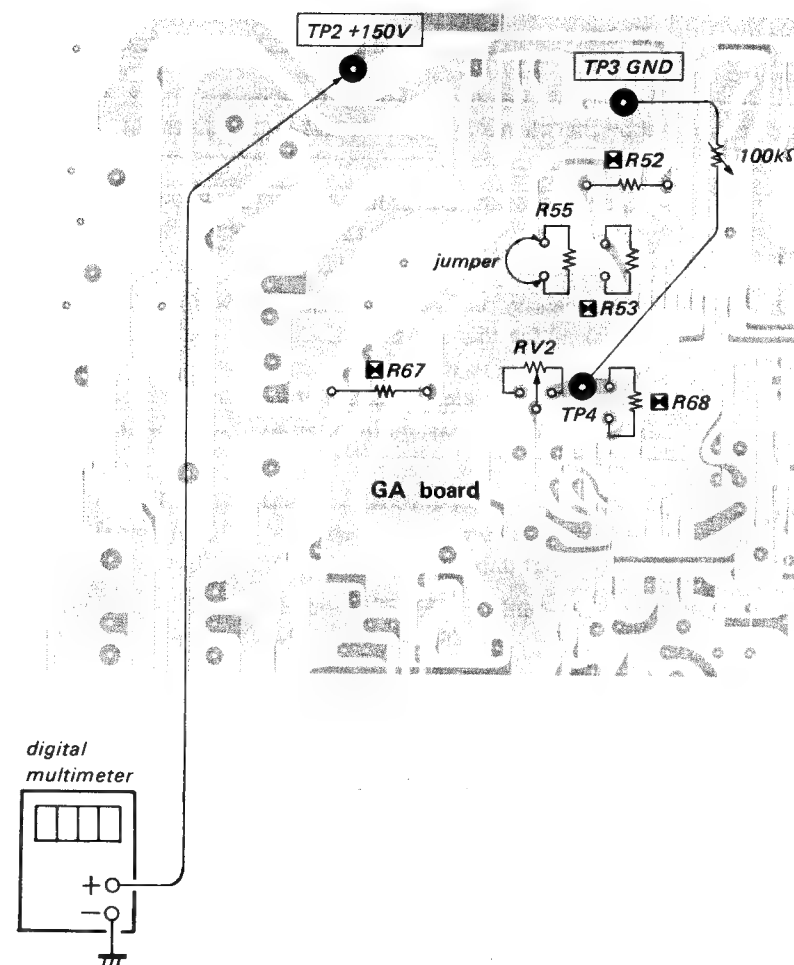
B+ MAX CONFIRMATION (☒ R67, R68)

When replacing the following components (marked ☑ on the schematic diagram), make this confirmation.

☑ GA Board .. C59, IC3, R67, R68, R78, RV2

It is necessary to use a digital multimeter for this confirmation.
Connect a digital multimeter to TP2 on GA Board.

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (manual button is out ⎍)
2. Confirm that the reading on the digital multimeter is +165.0V ±13.0V when RV2 variable resistor is turned to fully clockwise.
3. If the specifications are not met, select resistance values for R67 and R68 which satisfy the specifications.
4. After confirmation, make the reading on the digital multimeter into +150.0V ±1.0V by adjusting RV2 on GA Board.

GA board

digital multimeter

BEAM CURRENT PROTECTOR 1 CONFIRMATION (☒ R222)

When replacing the following components (marked ☑ on the schematic diagram), make this confirmatiojn.
   PA Board ..D205, D206, D215, IC2, R201, R202, R213, R214, R220, R221, R222, R223, R224, R242
   PB Board ..FBT, R1, R2, R5
1. Remove the PB-1 connector from PB board.
2. Connect a DC ammeter between Pin ① and Pin ② of the PB-1 connector and short-circuit Pin ③ and Pin ④ with a jumper.

PB-1 connector

3. Connect a digital multimeter to TP2 and TP4 (GND) of PA board.
4. Select the built-in all-white signal (Set the WHITE/OPERATE/SET UP selector on HB board to WHITE). Don't do it in free run.
5. Confirm that the reading on the digital multimeter of TP2 on PA board is between +31.0V and +33.5V.
6. If the reading on the digital multimeter of TP2 is between +31.0V and +33.5V and more than 32.5V, mount a 1MΩ1/4W resistor (metal–film) should be mounted at the portion of R222 on PA board. (Normally in this portion no component is mounted.)
7. Short-circuit R231 on PA board.
8. Short-circuit C1 on BI board.
9. Rotate the BRIGHTNESS and CONTRAST controls and confirm that the raster disappears when the value indicated on the DC ammeter is 2.20mA ±0.35mA.
10. Remove the short-circuit from R231 and C1 and restore the PB-1 connector to its original state.
11. Remove the jumpers and DC ammeter and reconnect the PB-1 connector.
12. Set the BRIGHTNESS and CONTRAST controls to their maximum positions and confirm that the ABL operates (OVERLOAD Lamp Lights up).

BEAM CURRENT PROTECTOR 2 (☒ R239)

When replacing the following components (marked ☑ on the schematic diagram), make this confirmation.
☑ PA Board ..D204, D216, R203, R204, R231, R232, R237, R238, R239, R240, R241, R247, IC3
   PB Board ..R3, R4, R6, FBT
1. Remove the PB-1 connector from PB board.
2. Connect a DC ammeter between Pin ① and Pin ② of the PB-1 connector and short-circuit Pin③ and Pin ④ with a jumper

PB-1 connector

3. Connect a digital multimeter to TP3 and TP4 (GND) of PA board.

4. Select the built-in all-white signal (Set the WHITE/OPERATE/SET UP selector on HB board to WHITE). Don't do it in free run.
5. Confirm that the reading on the digital multimeter of TP3 on PA board is between +31.0V and +33.5V.
6. If the reading on the digiatal multimeter of TP3 is between +31.0V and +33.5V and more than 32.5V, mount a 1MΩ1/4W resistor (metal–film) should be mounted at the portion of R239 on PA board. (Normally in this portion no component is mounted.)
7. Short-circuit R213 on PA board.
8. Short-circuit C1 on BI board.
9. Rotate the BRIGHTNESS and CONTRAST controls and confirm that the raster disappears when the value indicated on the DC ammeter is 2.20mA ±0.35mA.
10. Remove the short-circuit from R213 and C1 and restore the PB-1 connector to its original state.
11. Remove the jumpers and DC ammeter and reconnect the PB-1 connector.
12. Set the BRIGHTNESS and CONTRAST controls to their maximum positions and confirm that the ABL operates (OVERLOAD lamp lights up).

DC ammeter

PB board

jumper PB-1

3. Connect a digital multimeter to TP2 and TP4 (GND) of PA board.

4. Select the built-in all-white signal (Set the WHITE/OPERATE/SET UP selector on HB board to WHITE). Don't do it in free run.

5. Confirm that the reading on the digital multimeter of TP2 on PA board is between +31.0V and +33.5V.

6. If the reading on the digital multimeter of TP2 is between +31.0V and +33.5V and more than 32.5V, mount a 1MΩ1/4W resistor (metal–film) should be mounted at the portion of R222 on PA board. (Normally in this portion no component is mounted.)

7. Short-circuit R231 on PA board.

8. Short-circuit C1 on BI board.

9. Rotate the BRIGHTNESS and CONTRAST controls and confirm that the raster disappears when the value indicated on the DC ammeter is 2.20mA ±0.35mA.

10. Remove the short-circuit from R231 and C1 and restore the PB-1 connector to its original state.

11. Remove the jumpers and DC ammeter and reconnect the PB-1 connector.

12. Set the BRIGHTNESS and CONTRAST controls to their maximum positions and confirm that the ABL operates (OVERLOAD Lamp Lights up).

BEAM CURRENT PROTECTOR 2 (⊠ R239)

When replacing the following components (marked ☑ on the schematic diagram), make this confirmation.

☑ PA Board . .D204, D216, R203, R204, R231, R232, R237, R238, R239, R240, R241, R247, IC3

PB Board . .R3, R4, R6, FBT

1. Remove the PB-1 connector from PB board.

2. Connect a DC ammeter between Pin ① and Pin ② of the PB-1 connector and short-circuit Pin ③ and Pin ④ with a jumper.

PB-1 connector

DC ammeter

Short-circuit

3. Connect a digital multimeter to TP3 and TP4 (GND) of PA board.

---

4. Select the built-in all-white signal (Set the WHITE/OPERATE/SET UP selector on HB board to WHITE). Don't do it in free run.

5. Confirm that the reading on the digital multimeter of TP3 on PA board is between +31.0V and +33.5V.

6. If the reading on the digiatal multimeter of TP3 is between +31.0V and +33.5V and more than 32.5V, mount a 1MΩ1/4W resistor (metal–film) should be mounted at the portion of R239 on PA board. (Normally in this portion no component is mounted.)

7. Short-circuit R213 on PA board.

8. Short-circuit C1 on BI board.

9. Rotate the BRIGHTNESS and CONTRAST controls and confirm that the raster disappears when the value indicated on the DC ammeter is 2.20mA ±0.35mA.

10. Remove the short-circuit from R213 and C1 and restore the PB-1 connector to its original state.

11. Remove the jumpers and DC ammeter and reconnect the PB-1 connector.

12. Set the BRIGHTNESS and CONTRAST controls to their maximum positions and confirm that the ABL operates (OVERLOAD lamp lights up).

HIGH VOLTAGE HOLD DOWN ADJUSTMENT AND CONFIRMATION

(☒ R227, R228)

When replacing the following components (marked ☑ on the schematic diagram), make this adjustment.

☑ DCT block

PA Board ..D205, D207, D215, IC2, R201, R202, R213, R214, R225, R226, R227, R228, R243, R245

It is necessary to use an electrostatic voltmeter or equivalent for this adjustment. Connect the electrostatic voltmeter to the anode cap.

Even though an electrostatic voltmeter may not be used, connect digital multimeter to ⑦ pin of IC4 on PA Board.

In case of using an electrostatic voltmeter

1. Connect the electrostatic voltmeter to the anode cap and connect a digital multimeter to TP1 and TP4 (GND) on PA board.

Note: Use an electrostatic multimeter which is calibrated and which has $2 \times 10^9 \Omega$ or more input impedance. (Example: ESH-27X or ESH-23X of the SINGER COMPANY)
Use a digital multimeter which has 4 digits or more.

2. Receive a color bar signal and set the CONTRAST and BRIGHTNESS controls to the preset positions. (manual switch is OUT□.)

3. Determine the values of R227 and R228 as to get voltage of 9.55 ±0.13V at TP1.

4. Connect 500kΩ variable resistor with R126 in parallel on PA board.

5. Confirm that the reading on the electrostatic voltmeter drops abruptly from 28.0kV ~ 30.0kV to 0V by turning slowly the 500kΩ variable resistor so that the value of the resistor decrease from maximum value.

6. Remove the 500kΩ variable resistor from R126 and confirm again that the voltage of the anode is 27.0kV ±0.1kV.

In case of not using an electrostatic voltmeter (using a digital multimeter.)

1. Connect the digital multimeter to TP1 and TP4 (GND) and to Pin ⑦ of IC4 and TP4 (GND).

2. Receive a color bar signal and set the CONTRAST and BRIGHTNESS controls to the preset positions.

3. Determine the values of R227 and R228 as to get voltage of 9.40 ±0.13V at TP1.

4. Connect 500kΩ variable resistor with R126 in parallel on PA board.

5. Confirm that the raster disappears when the voltage at Pin ⑦ of IC4 reaches 9.40 ±0.13V by turning slowly the 500kΩ variable resistor so that the value of the resistor decrease from maximum value.

6. Remove the 500kΩ variable resistor from R126.
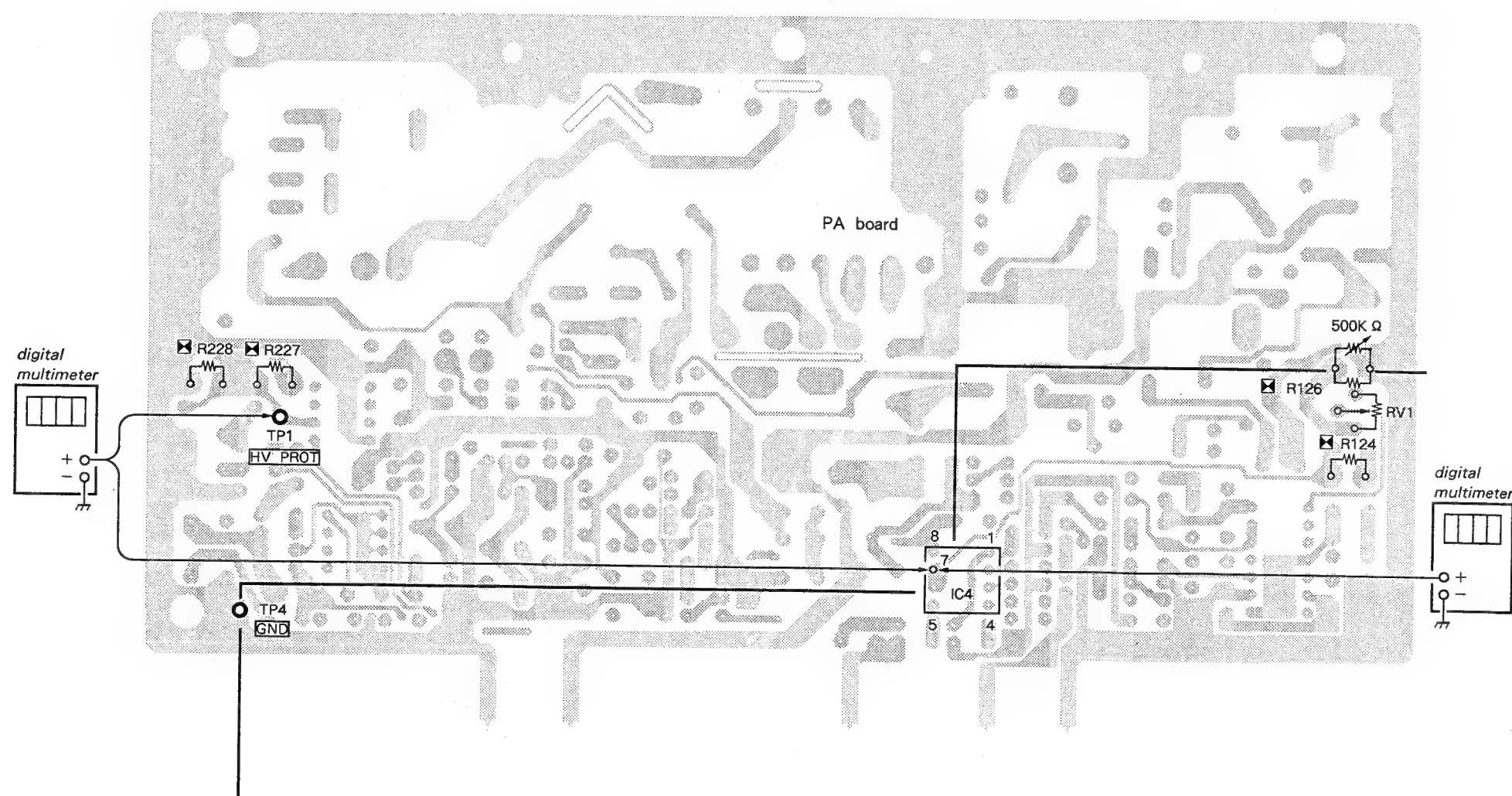
ostatic voltmeter (using a

eter to TP1 and TP4 (GND)
4 (GND).
nd set the CONTRAST and
he preset positions.
227 and R228 as to get vol-

sistor with R126 in parallel

appears when the voltage at
) ±0.13V by turning slowly
so that the value of the re-
um value.
e resistor from R126.
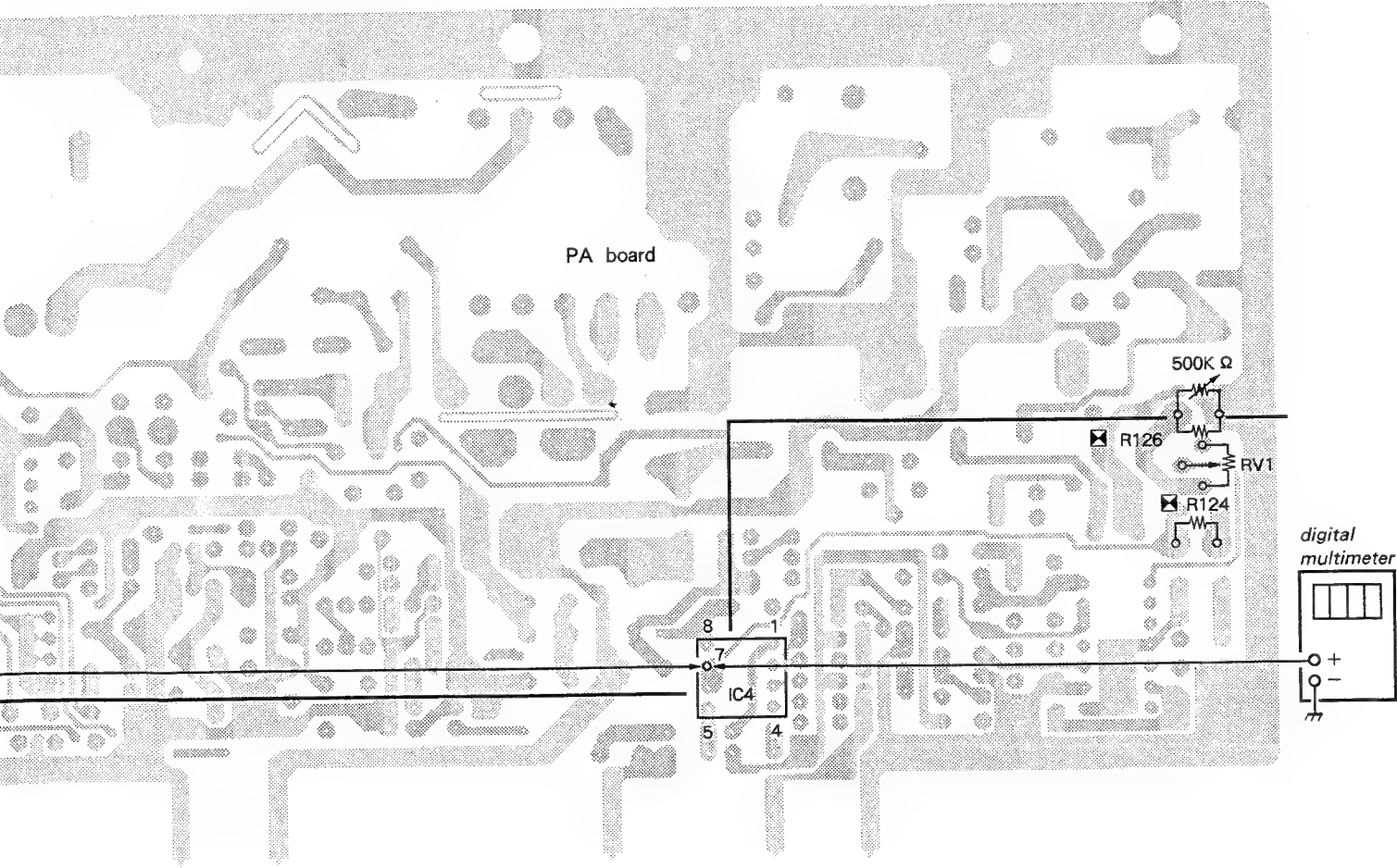
HIGH VOLTAGE REGULATOR CONFIRMA-TION

(◪ R124, R126)

When replacing the following components (marked ◪ on the schematic diagram), make this adjustment.

◪ DCT block
  PA Board .. D216, IC1, IC4, R123, R124, R125, R126, R136, R137, R138, R203, R204, RV1

It is necessary to use an electrostatic voltmeter or equivalent for this adjustment. Connect the electrostatic voltmeter to the anode cap.
Even though an electrostatic voltmeter may not be used, connect digital multimerter to ⑦ pin of IC4 on PA Board.

Note: Use an electrostatic voltmeter which is calibrated, and which has $2 \times 10^9 \Omega$ or more input impedance.

example: ESH-27X or ESH-23X of the SINGER COMPANY

Use a digital multimeter which has 4 digit or more.

● **In case of using an electrostatic voltmeter**

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (manual switch is out ⊓)

2. Turn RV1 on the PA Board for a maximum reading on the electrostatic voltmeter. (Fully clockwise)

3. Confirm that the indicated value on the electrostatic voltmeter is 27.40kV ±0.1kV at this time.

4. If necessary, select the value of R124 and R126 (1/4W metal-film) and repeat above step 2 through 4.

5. After confirmation, adjust RV1 for 27.0kV ±0.1kV on the electrostatic voltmeter.

● **In case of using a digital multimeter**

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (manual switch is out ⊓)

2. Connect the digital multimeter to Pin ⑦ of IC4 and TP4 (GND) on PA board.

3. Set RV1 on PA board to its mechanical center.

4. Select resistance values for R124 and R126 which provide a voltage reading of 8.75V ±0.1V at Pin ⑦ of IC4 and mount.

PA board

500K Ω

◪ R126

RV1

◪ R124

digital multimeter

8 1
7
IC4
5 4

+
−

4-7. CIRCUIT ADJUSTMENTS

- To make the following adjustments, unless otherwise specified, the controls knobs and switches shall be preset as described below.

FRONT PANEL
- INPUT selector .... 1 ⎤ HX board
- CONTRAST MANUAL switch ...... PRESET ⎥
- BRIGHTNESS MANUAL switch ... PRESET ⎤
- CHROMA MANUAL switch .... PRESET ⎥ HW board
- PHASE MANUAL switch .... PRASET ⎦
- SCAN MODE switch
  - ▣ UNDER SCAN .... NOR ⎤
  - ▥ H. DELAY .... NOR ⎥
  - ▤ V. DELAY .... NOR ⎥
- SCREEN switch (R) .... NOR ⎥ HA board
- SCREEN switch (G) .... NOR ⎥
- SCREEN switch (B) .... NOR ⎥
- APT switch .... NOR ⎥
- BLUE ONLY switch .... NOR ⎥
- MODE selector .... AUTO ⎦

SUB CONTROL PANEL
- FORMAT button .... CODED ⎤
- INPUT button .... A ⎥
- SYNC button .... INT ⎥
- COLOR SYSTEM button .... NTSC (BVM-1311/1911) ⎥
  - PAL (BVM-1411P/2011P) ⎥
- YC SEP button .... COMB (BVM-1311/1911) ⎥
  - TRAP (BVM-1411P/2011P) ⎥
- WHITE BALANCE button .... D65/D93 ⎥ HY board
- ASPECT button .... 4 : 3 ⎥
- PIC SETUP button .... OFF ⎥
- SAD/VITC/MARKER button .... OFF ⎥
- FILTER button .... OFF ⎥
- MATRIX button .... OFF ⎥
- PAL S/SECAM F/COMB S button . ⎥
  .... OFF ⎥
- CROSS HATCH button .... OFF ⎥
- SPLIT SCREEN button .... OFF ⎥
- WHITE button .... OFF ⎥
- GRAY button .... OFF ⎦
- AFC switch .... 2m sec ⎤ DA board

SUB CONTROL PANEL (HY board)

FRONT PANEL

4-19

1. SUB CHROMA, SUB PHASE ADJUSTMENT

Color-bar signal

VIDEO A terminal

75Ω terminator

HY board

Tektronix 1410 (NTSC)/1411 (PAL) Generator
• NTSC color bar signal
  (FULL FIELD color-bar)
  (75% AMPL)
  (100 IRE)
  (7.5 IRE set up)
• PAL color bar signal
  (FULL FIELD color-bar)
  (75% AMPL)
  (100 IRE)
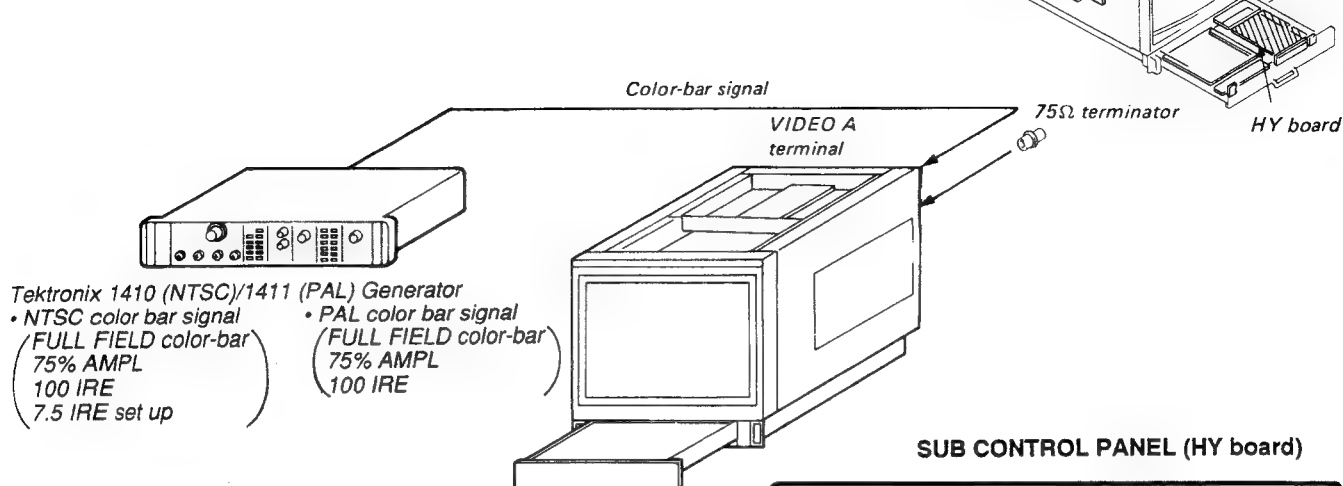
1. Press the MENU switch to select the PRESET menu.
2. CONTRAST, BRIGHT, CHROMA, PHASE MANUAL switch
   (FRONT PANEL)·····················MANUAL
3. Turn each volume control to adjust so that the value on the screen
   becomes 100.
4. Save the DATA.

SUB CONTROL PANEL (HY board)

PHASE control   BRIGHTNESS control

CHROMA control   CONTRAST control

FRONT PANEL

PHASE MANUAL SW

CONTRAST MANUAL SW

CHROMA MANUAL SW

BRIGHTNESS MANUAL SW
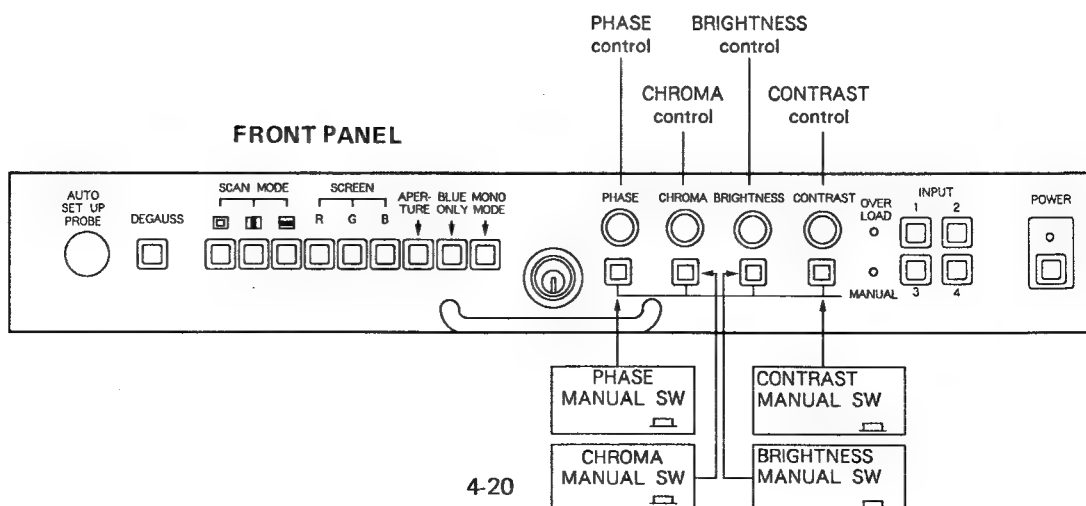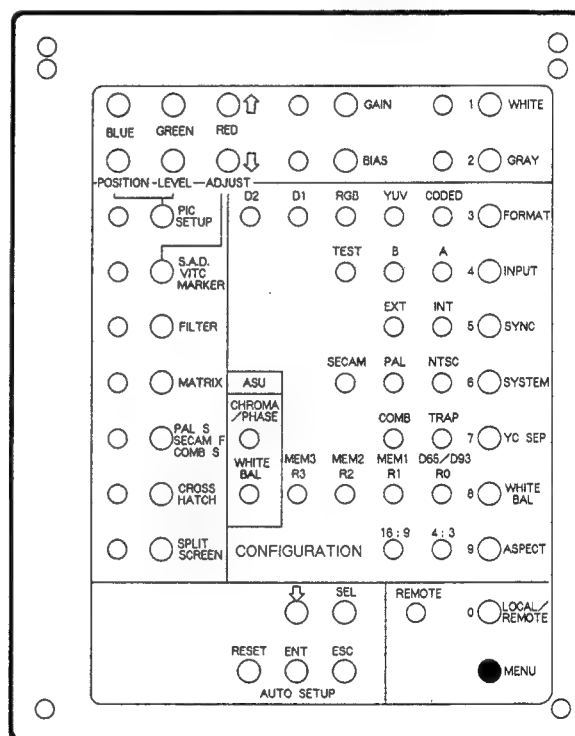
2. BJ Board BRT PULSE ADJUSTMENT
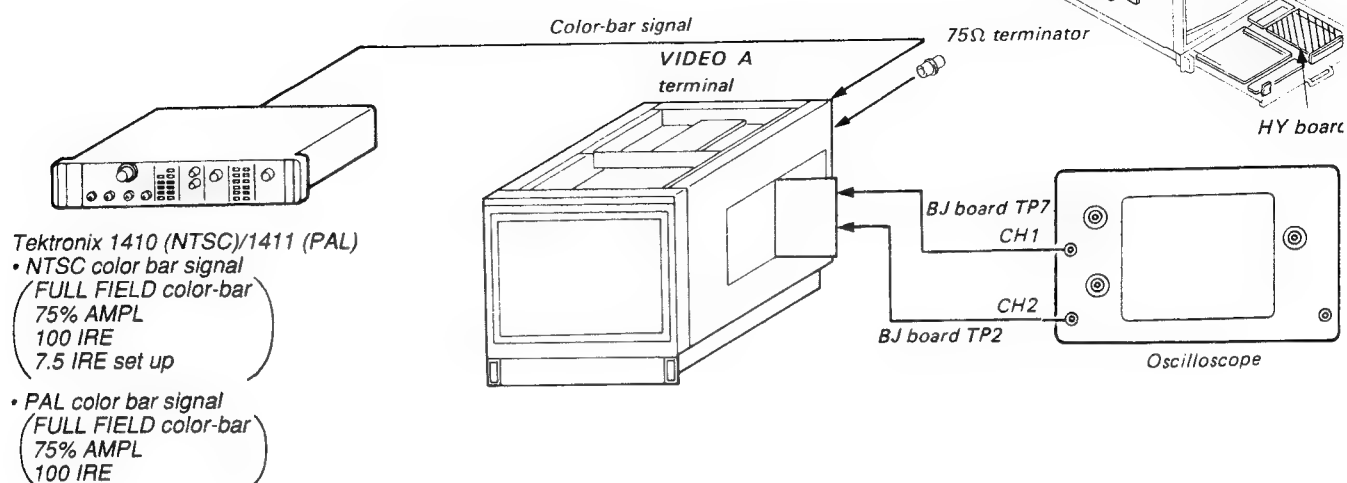
Tektronix 1410 (NTSC)/1411 (PAL)
- NTSC color bar signal
  $\left(\begin{array}{l}\textit{FULL FIELD color-bar}\\ \textit{75% AMPL}\\ \textit{100 IRE}\\ \textit{7.5 IRE set up}\end{array}\right)$
- PAL color bar signal
  $\left(\begin{array}{l}\textit{FULL FIELD color-bar}\\ \textit{75% AMPL}\\ \textit{100 IRE}\end{array}\right)$

1. Input a color-bar signal to VIDEO A terminal of the set.
2. Connect an oscilloscope (CH1 probe) to the TP7 of BJ board and oscilloscope (CH2 probe) to the TP2 of BJ board.
3. Adjust RV7 to obtain the waveform on the oscilloscope as shown in Fig. 2-1.
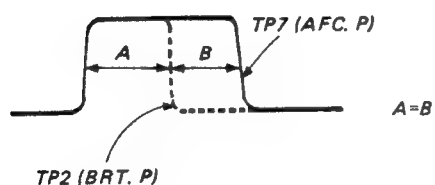
Fig. 2-1
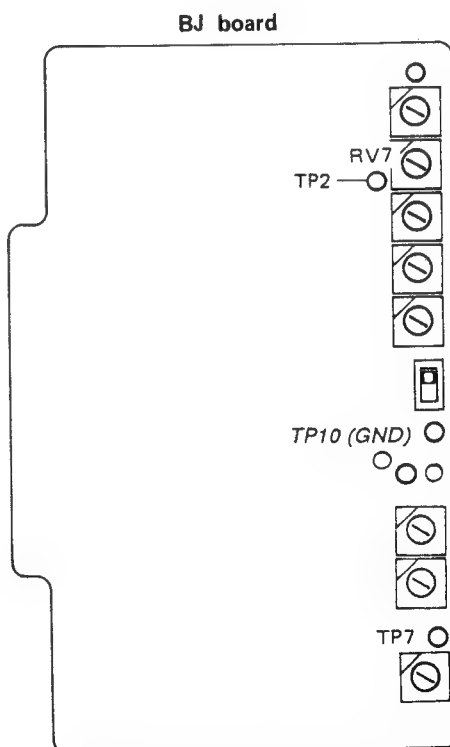
BJ board

BJ Board SUMPRING PULSE ADJUSTMENT
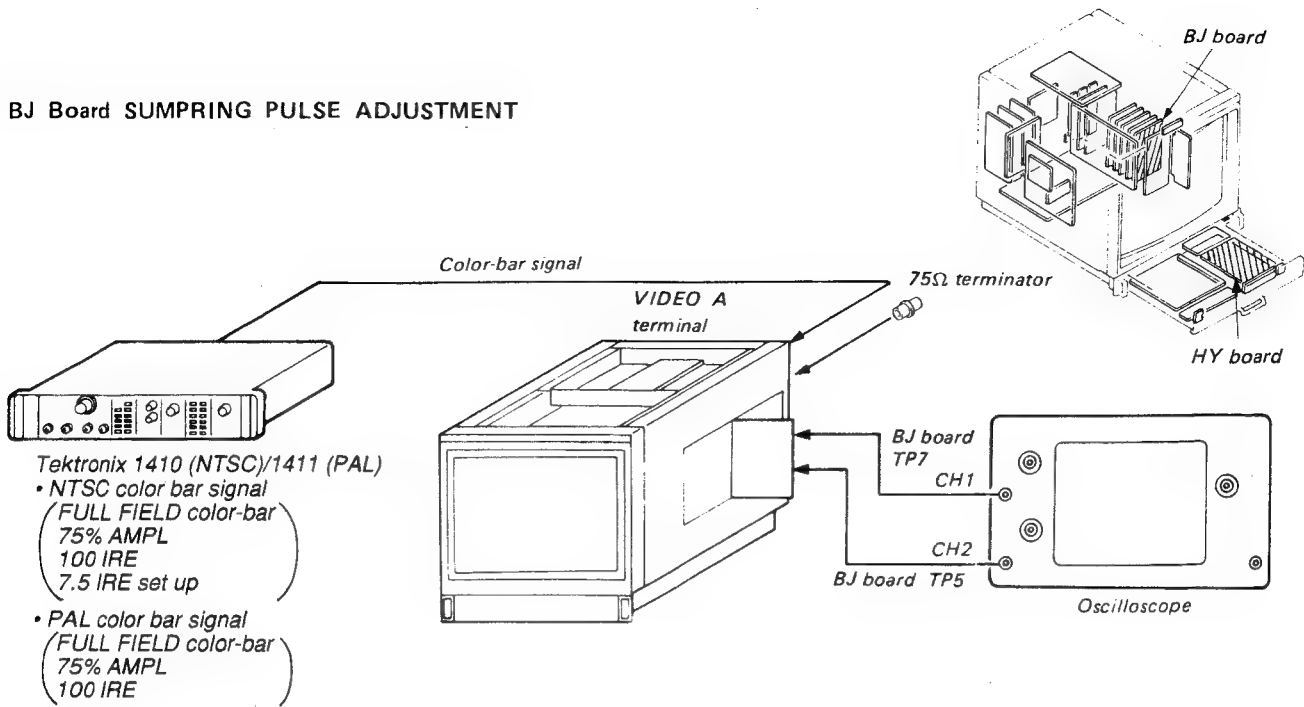
Color-bar signal

VIDEO A
terminal

75Ω terminator

BJ board

HY board

Tektronix 1410 (NTSC)/1411 (PAL)
- NTSC color bar signal
  /FULL FIELD color-bar\
  75% AMPL
  100 IRE
  \7.5 IRE set up   /
- PAL color bar signal
  /FULL FIELD color-bar\
  75% AMPL
  \100 IRE   /

BJ board
TP7

CH1

CH2

BJ board TP5

Oscilloscope

1. Input a color-bar signal to VIDEO A terminal of the set.
2. Connect an osilloscope (CH 1 probe) to the TP7 of BJ board and Connect an oscilloscope (CH 2 probe) to the TP5 of BJ board.
3. Adjust RV5 to obtain the waveform on the oscilloscope as shown in Fig. 2-2.

TP7

A   B

TP5

A =B

Fig. 2-2

BJ board

TP10 (GND)

TP5

RV5

TP7
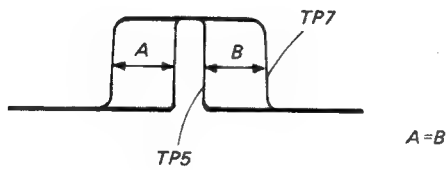
4-22
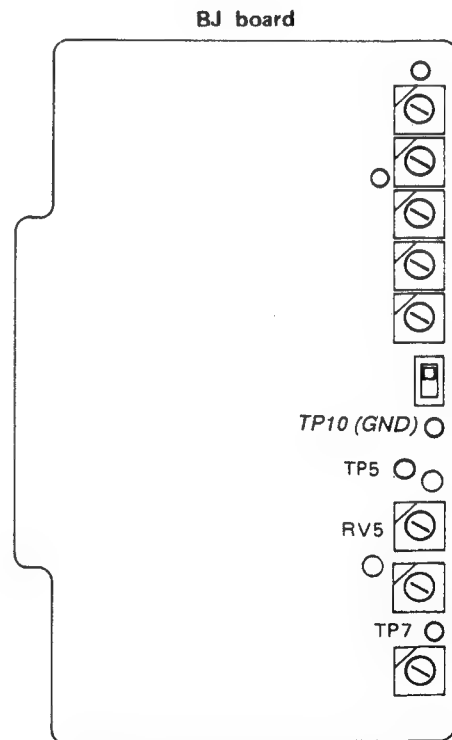
3. EACH CHANNEL LEVEL ADJUSTMENT
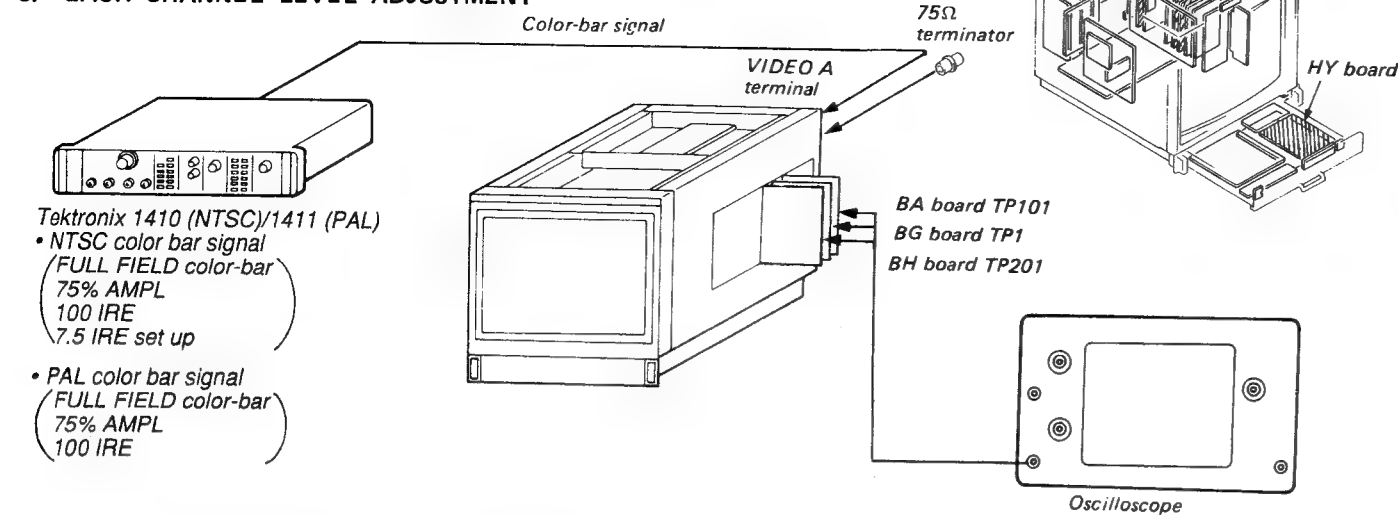
Color-bar signal

VIDEO A terminal

75Ω terminator

BA board
BG board
BH board

HY board

Tektronix 1410 (NTSC)/1411 (PAL)
• NTSC color bar signal
 (FULL FIELD color-bar
 75% AMPL
 100 IRE
 7.5 IRE set up)

• PAL color bar signal
 (FULL FIELD color-bar
 75% AMPL
 100 IRE)

BA board TP101
BG board TP1
BH board TP201

Oscilloscope

• FILTER button (SUB CONTROL PANEL) .... OFF
• MODE selector (FRONT PANEL) .... MONO (□)
• INPUT selector (FRONT PANEL) .... 1 (□)

BA board
1. Input a color-bar signal to VIDEO A terminal to the set.
2. Connect an oscilloscope to the TP101 of BA board.
3. Adjust to 1.0Vp-p with RV101 of BA board as shown in Fig. 3-1.

1Vp-p
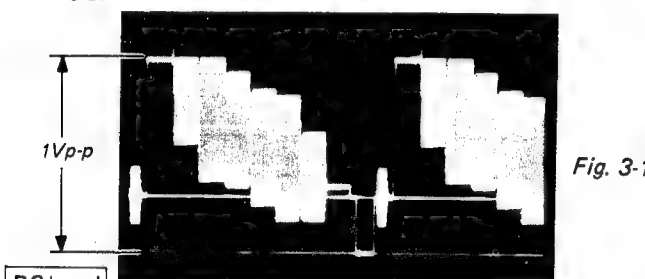
Fig. 3-1

BG board
4. Connect an oscilloscope to the TP1 of BG board.
5. Adjust to 1.0Vp-p with RV3 of BG board as shown in Fig. 3-1.
6. Connect an oscilloscope to the TP201 of BH board.

7. Adjust FRONT BRT VR so that Ⓐ (black level) is 0V DC as shown in Fig. 3-2.
8. Adjust FRONT CONT VR so that Ⓑ (100% white level) is -0.7V DC as shown in Fig. 3-2.

0V dc

0.7Vdc

Ⓔ Ⓒ Ⓑ Ⓓ

Fig. 3-2
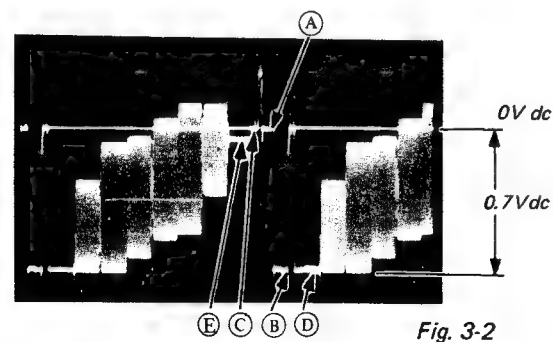
Ⓐ ..... Black level
Ⓑ ..... 100% White level
Ⓒ ..... 0 IRE level
Ⓓ ..... 100 IRE level
Ⓔ ..... 7.5 IRE level

BH board
9. S2 (BH Board) .... 0 IRE
   Adjust RV1 of BH board so that the Ⓒ (0 IRE level) coincides with Ⓐ (Black level) as shown in Fig. 3-3.
10. Adjust RV3 of BH board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-3.

Ⓒ Ⓐ

Make flat

Ⓒ Ⓐ

Ⓑ Ⓓ

Ⓑ Ⓓ

Make flat

Fig. 3-3
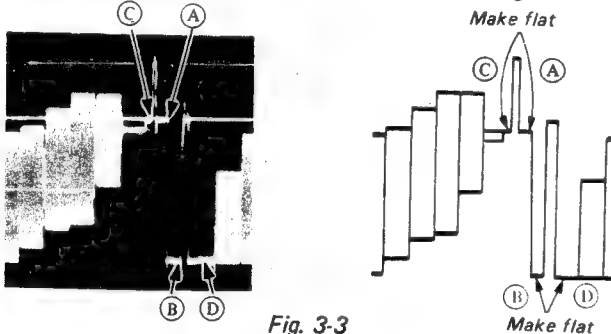
BH board
11. S2 (BH Board) ..... 7.5 IRE
    Adjust RV2 of BH board so that the Ⓔ (7.5 IRE level) coincides with Ⓐ (Black level) as shown in Fig. 3-4.
12. Set S2 (BH Board) to AUTO.

Ⓔ Ⓐ

Fig. 3-4

FRONT PANEL

EN B APER- BLUE MONO
TURE ONLY MODE

PHASE CHROMA BRIGHTNESS CONTRAST

OVER LOAD

INPUT 1 2

POWER

MANUAL 3 4

MODE selector
MONO □

SUB CONTROL PANEL (HY board)

BLUE GREEN RED

GAIN

WHITE

POSITION-LEVEL-ADJUST

BIAS

GRAY

PIC SETUP

D2 D1 RGB YUV CODED

FORMAT

S.A.D. VITC MARKER

TEST Ⓑ Ⓐ

INPUT

FILTER

EXT INT

SYNC

MATRIX

ASU

SECAM PAL NTSC

SYSTEM

CHROMA /PHASE

COMB TRAP

PAL S SECAM F COMB S

WHITE BAL

MEM3 MEM2 MEM1
R3 R2 R1

D65/D93
R0

YC SEP

WHITE BAL

CROSS HATCH

SPLIT SCREEN

CONFIGURATION

16:9 4:3

ASPECT

SEL REMOTE

LOCAL/ REMOTE

RESET ENT ESC

MENU

AUTO SETUP

BA board

BA-6
BA-5
BA-4

RV101

TP101

BG board

TP1
RV3

BH board

0 IRE
AUTO
7.5 IRE
S2

RV1
RV2
RV3

TP201 GREEN

13. Input a color-bar signal to RGB input terminal of the set.
   - SYNC button (SUB CONTROL PANEL) .... EXT
   - FORMAT button (SUB CONTROL PANEL) .... RGB

BA board
BH board
HY board

COMP SYNC signal

RGB color-bar signal

QB board
QA board

R/R-Y

G/Y
TEST

B/B-Y

75Ω terminator

75Ω terminator

Tektronix 1410 (NTSC)/1411 (PAL)
- NTSC color bar signal
  (FULL FIELD color-bar
  75% AMPL
  100 IRE
  7.5 IRE set up)

- PAL color bar signal
  (FULL FIELD color-bar
  75% AMPL
  100 IRE)

BH board
TP101
TP201
TP301

Oscilloscope

14. Connect an oscilloscope to TP101 of BH board.
15. Adjust RV401 of BA board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-5.
16. Connect an oscilloscope to TP201 of BH board.
17. Adjust RV501 of BA board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-5.
18. Connect an oscilloscope to TP101 of BH board.
19. Adjust RV601 of BA board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-5.

Fig. 3-5

Ⓑ Ⓓ

FRONT PANEL

AUTO SET UP PROBE   DEGAUSS   SCAN MODE   SCREEN   APER-TURE   BLUE ONLY   MONO MODE   PHASE   CHROMA   BRIGHTNESS   CONTRAST   OVER LOAD   INPUT   POWER

R G B

MANUAL 1 2 3 4

BH board

BA board

RV601

RV501

RV401

TP101 RED
TP201 GREEN
TP301 BLUE

SUB CONTROL PANEL (HY board)

BLUE GREEN RED

GAIN   1 WHITE

BIAS   2 GRAY

POSITION—LEVEL—ADJUST

PIC SETUP   D2 D1 RGB YUV CODED   3 FORMAT

S.A.D. VITC MARKER   TEST B A   4 INPUT

FILTER   EXT INT   5 SYNC

MATRIX   ASU   SECAM PAL NTSC   6 SYSTEM

CHROMA /PHASE   COMB TRAP   7 YC SEP

PAL S SECAM F COMB S   WHITE BAL   MEM3 MEM2 MEM1 D65/D93   8 WHITE BAL

CROSS HATCH   R3 R2 R1 R0

SPLIT SCREEN   CONFIGURATION   16:9 4:3   9 ASPECT

SEL   REMOTE   0 LOCAL/REMOTE

RESET ENT ESC   MENU

AUTO SETUP

4. BA Board INPUT CIRCUIT FREQUENCY CHARACTERISTIC ADJUSTMENT
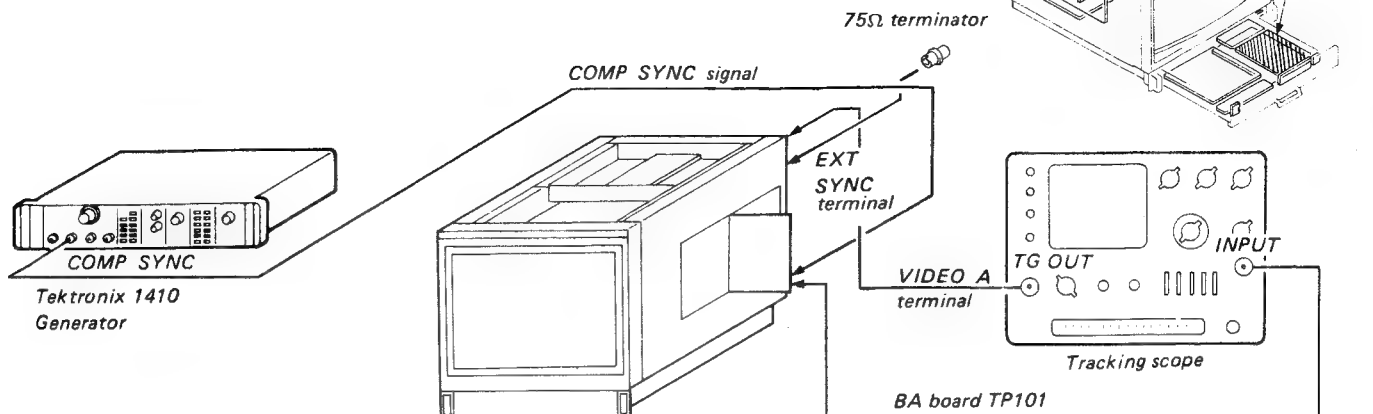
Fig. 4-1

1. Complete the connection as shown in Fig 4-1.
   - FORMAT button (SUB CONTROL PANEL) .... CODED
   - INPUT selector (FRONT PANEL) 1
   - SYNC button (SUB CONTROL PANEL) .... EXT
   - CONTRAST control (FRONT PANEL) .... Minimum
   - BRIGHTNESS control (FRONT PANEL) .... Minimum

2. Adjust CV101 so that minimum as shown in Fig. 4-2.
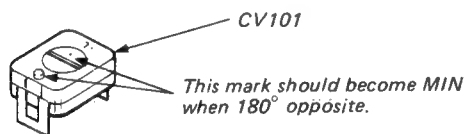
Fig. 4-2

3. Adjust output waveform peak to 12MHz with CV102 of the BA board as shown in Fig. 4-3.
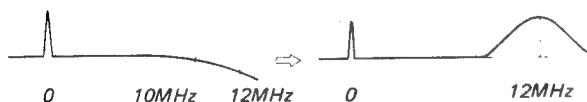
Fig. 4-3

4. Adjust CV101 of the BA board so that the output waveform becomes flat in a range of 0 to 10MHz as shown in Fig. 4-4.

Fig. 4-4

BA board

FRONT PANEL

4-27
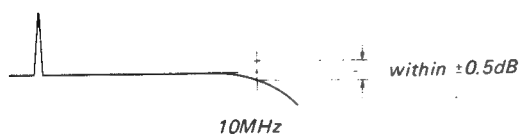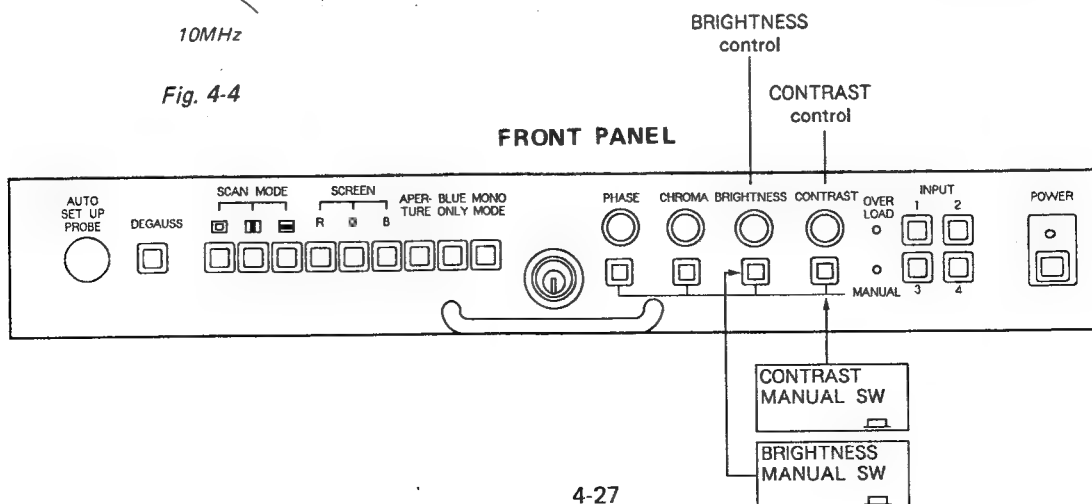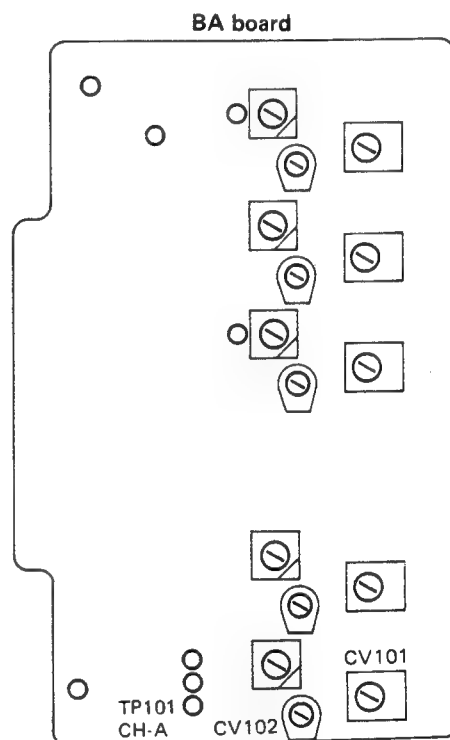
5. In the same way, perform the adjustment for 2 CH, under the following conditions.

INPUT	INPUT button (SUB CONTROL PANEL)	FORMAT button	TP (BA board)	CV (BA board)
B	B	CODED	TP201	CV201, 202
R/R-Y		RGB	TP401	CV401, 402
G/Y/TEST		RGB	TP501	CV501, 502
B/B-Y		RGB	TP601	CV601, 602

SUB CONTROL PANEL (HY board)
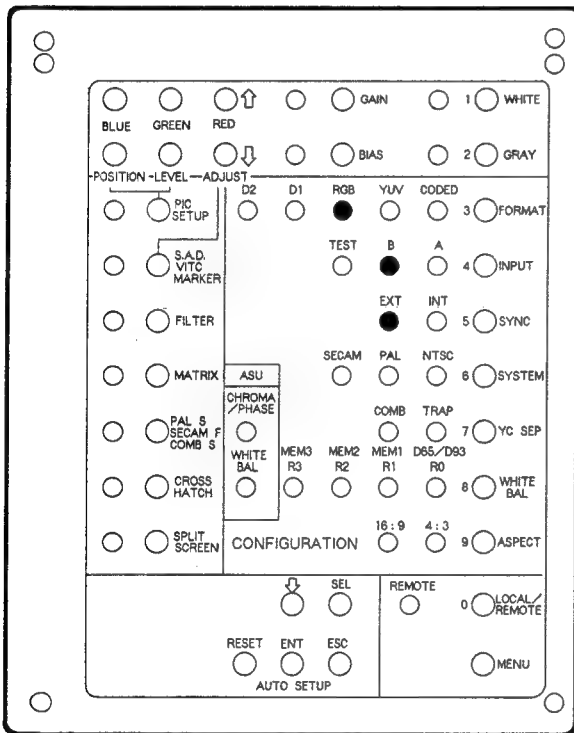
BA board
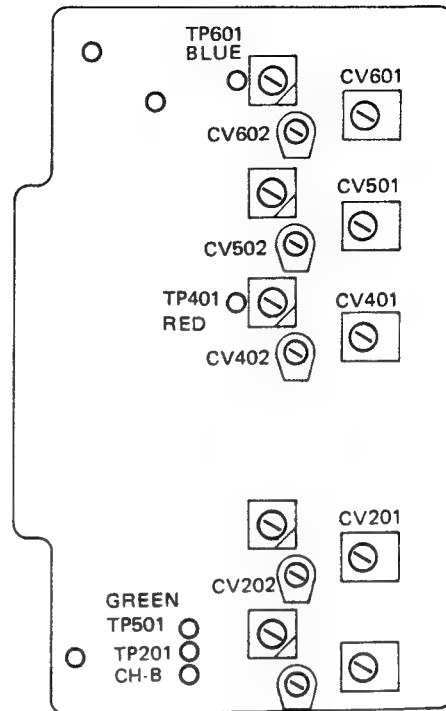
FRONT PANEL
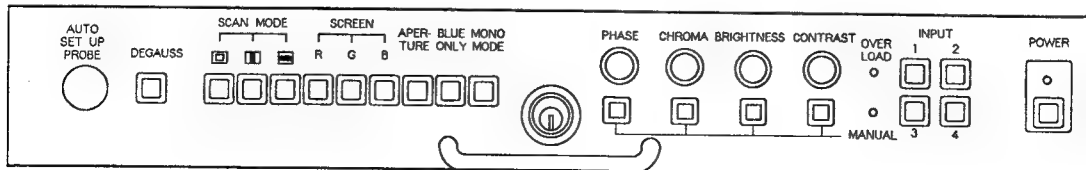
5. BG Board FREQUENCY CHARACTERISTIC ADJUSTMENT
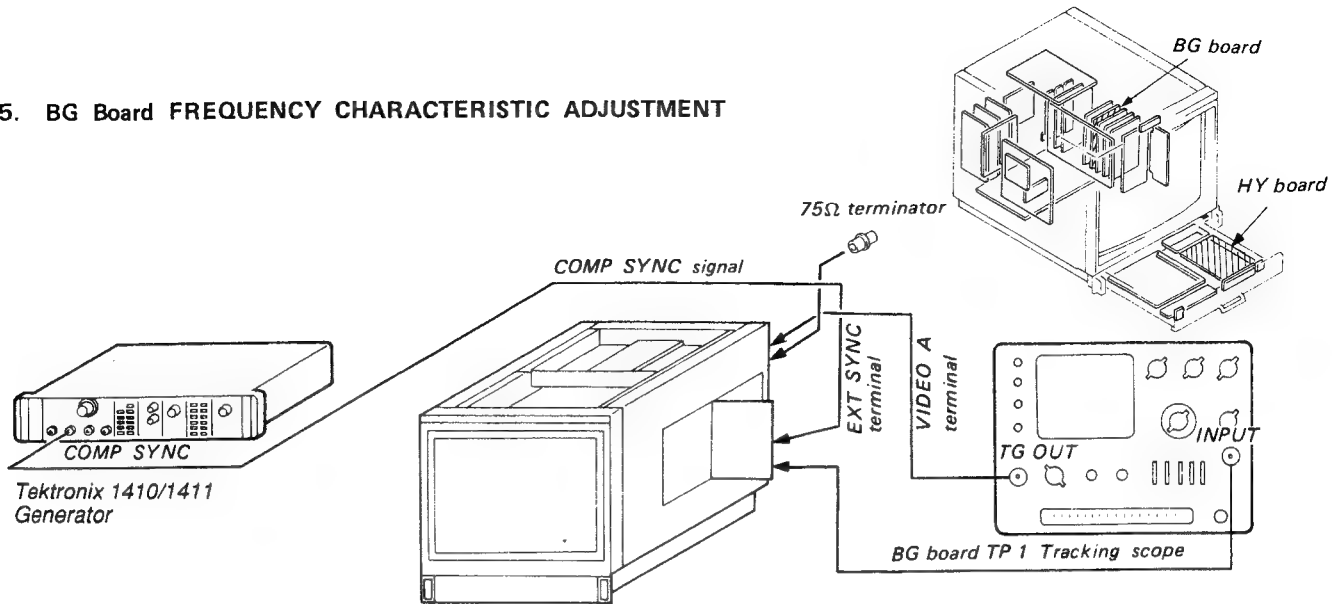
Fig. 5-1

1. Complete the connection as shown in Fig 5-1.
   - SYNC button (SUB CONTROL PANEL)··········· EXT
   - CONTRAST control ....Minimum
   - BRIGHTNESS control ....Minimum
   - S1 (BG Board)...4.5MHz (4.5 ▭ 6.5)

2. Adjust RV1, CV2 and CV3 of the BG board so that the output waveform becomes flat in a range of 0 to 10MHz as shown in Fig. 5-2. (within 0±0.5dB)

   *Waveform movement by RV1, CV2, CV3

   < RV1 >

   < CV2 >

   < CV3 >

Fig. 5-2
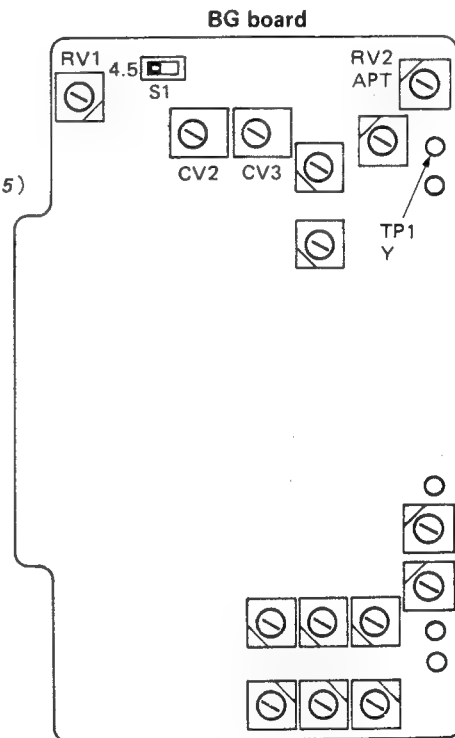
3. Adjust with RV2 (BG board) to the position in which the APT (Fig. 5-3.) begins to become effective.

Fig. 5-3

FRONT PANEL
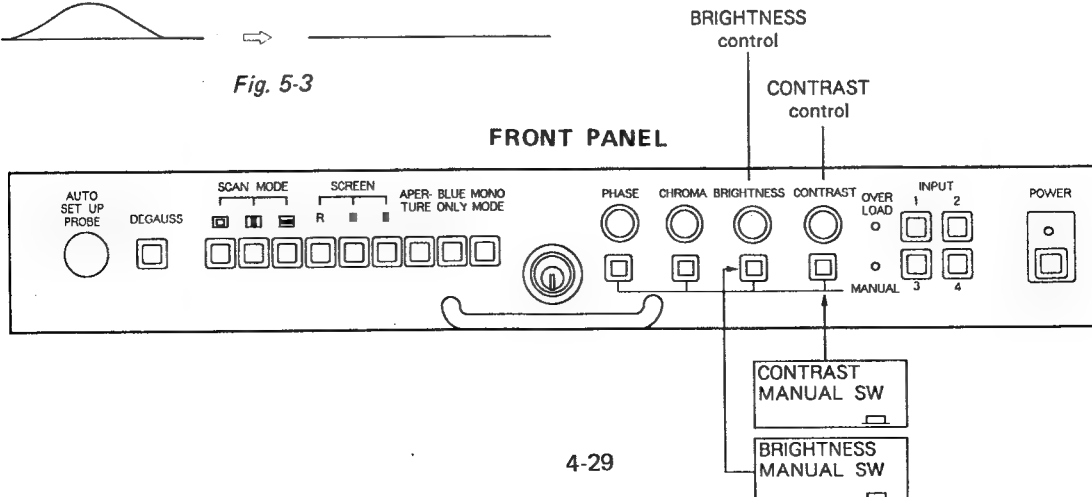
6. COMPONENT INPUT LEVEL ADJUSTMENT
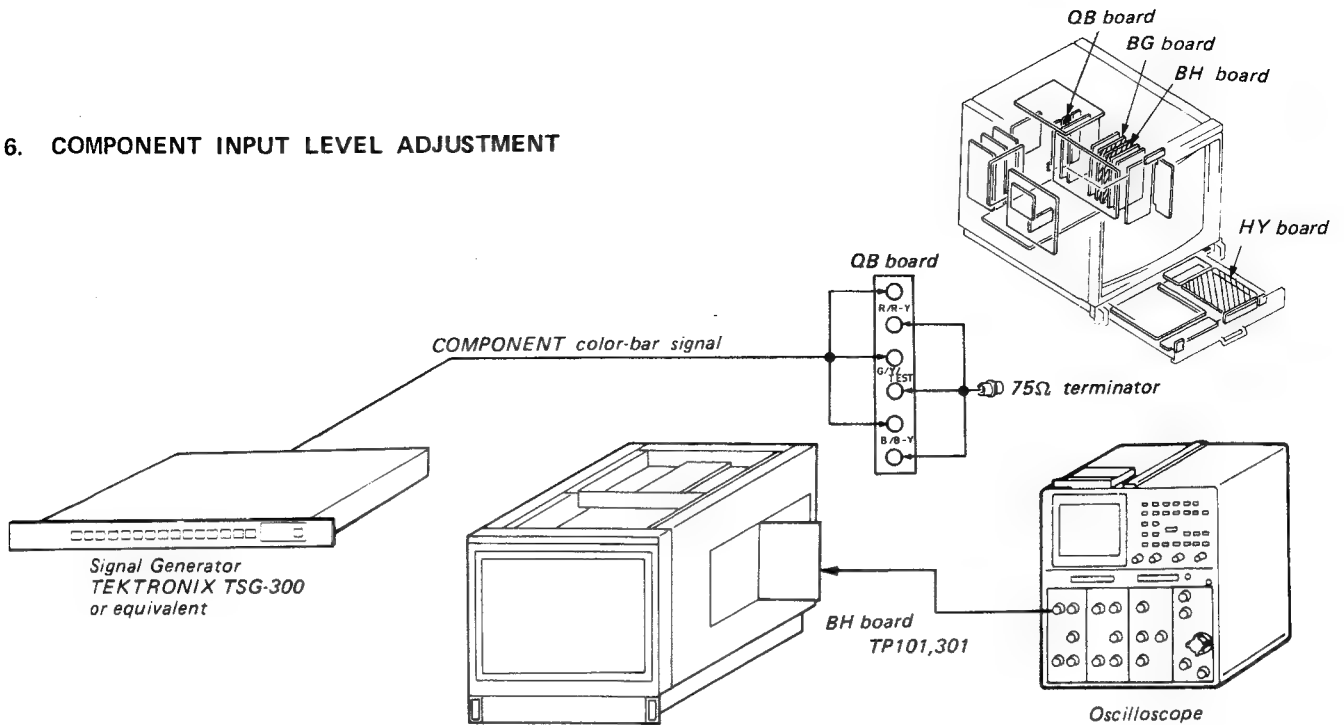
Fig. 6-1

1. Complete the connections as shown in Fig. 6-1.
   - FORMAT button (SUB CONTROL PANEL) ······· YUV
2. Connect an oscilloscope to the TP-101 of BH board.
3. Adjust RV21 of BG board so that the output waveform becomes flat. (Fig. 6-2)

4. Connect an oscilloscope to the TP301 of BH board.
5. Adjust RV22 of BG board so that the input waveform becomes flat. (Fig. 6-3)

Fig. 6-2

Fig. 6-3

BH board

TP101
TP301

BG board

RV21
RV22

SUB CONTROL PANEL (HY board)

				GAIN		1	WHITE
BLUE	GREEN	RED ⇧					
		⇩		BIAS		2	GRAY

POSITION — LEVEL — ADJUST

		D2	D1	RGB	YUV	CODED		
PIC SETUP		○	○	○	●	○	3	FORMAT
S.A.D. VITC MARKER			TEST	B	A		4	INPUT
FILTER				EXT	INT		5	SYNC
MATRIX	ASU		SECAM	PAL	NTSC		6	SYSTEM
	CHROMA /PHASE				COMB	TRAP	7	YC SEP
PAL S SECAM F COMB S	WHITE BAL	MEM3 R3	MEM2 R2	MEM1 R1	D65/D93 R0			
CROSS HATCH							8	WHITE BAL
SPLIT SCREEN	CONFIGURATION		16:9	4:3			9	ASPECT

⇩ SEL   REMOTE   0 LOCAL/REMOTE

RESET ENT ESC   MENU

AUTO SETUP

BH board

TP101
TP301

BG board

RV21
RV22

SUB CONTROL PANEL (HY board)

				GAIN		1	WHITE
BLUE	GREEN	RED ⇧					
		⇩		BIAS		2	GRAY

POSITION — LEVEL — ADJUST

		D2	D1	RGB	YUV	CODED		
PIC SETUP		○	○	○	●	○	3	FORMAT
S.A.D. VITC MARKER			TEST	B	A		4	INPUT
FILTER				EXT	INT		5	SYNC
MATRIX	ASU		SECAM	PAL	NTSC		6	SYSTEM
	CHROMA /PHASE				COMB	TRAP	7	YC SEP
PAL S SECAM F COMB S	WHITE BAL	MEM3 R3	MEM2 R2	MEM1 R1	D65/D93 R0			
CROSS HATCH							8	WHITE BAL
SPLIT SCREEN	CONFIGURATION		16:9	4:3			9	ASPECT

⇩ SEL   REMOTE   0 LOCAL/REMOTE

RESET ENT ESC   MENU

AUTO SETUP

7. BJ Board BURST GATE PULSE ADJUSTMENT
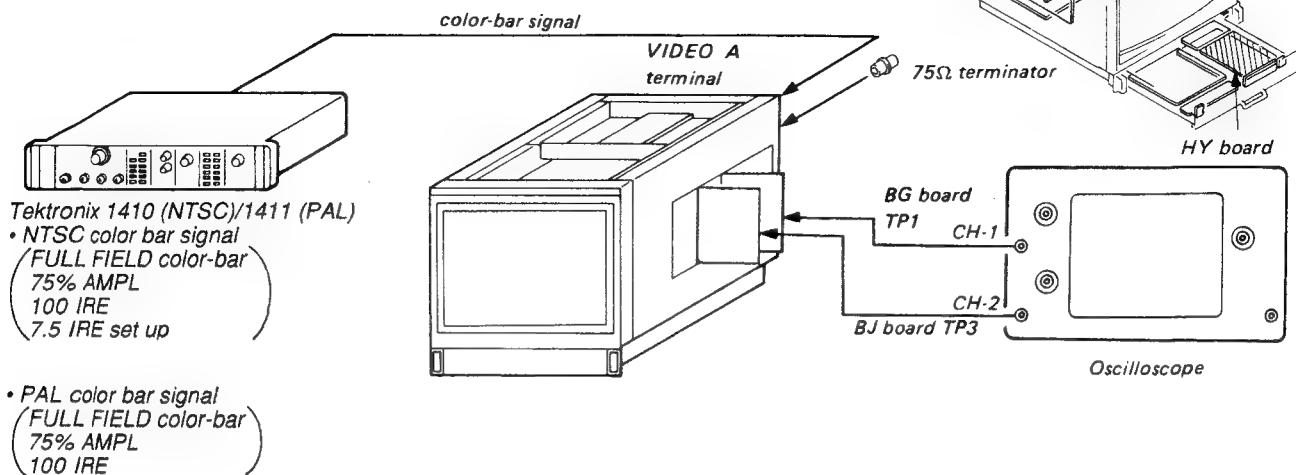
color-bar signal

VIDEO A
terminal

75Ω terminator

BG board
BJ board

HY board

BG board
TP1   CH-1

BJ board TP3   CH-2

Oscilloscope

Tektronix 1410 (NTSC)/1411 (PAL)
• NTSC color bar signal
  (FULL FIELD color-bar
  75% AMPL
  100 IRE
  7.5 IRE set up)

• PAL color bar signal
  (FULL FIELD color-bar
  75% AMPL
  100 IRE)

1. Input a color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope (CH-1 probe) to the TP1 of BG board and connect an oscilloscope (CH-2 probe) to the TP3 of BJ board.
3. Adjust RV8 of BJ board so that the with A width is 4.3µs as shown in Fig. 7-1.

TP1 (BJ board)

TP3 (BG board)

TP1

A

A=4.3µs
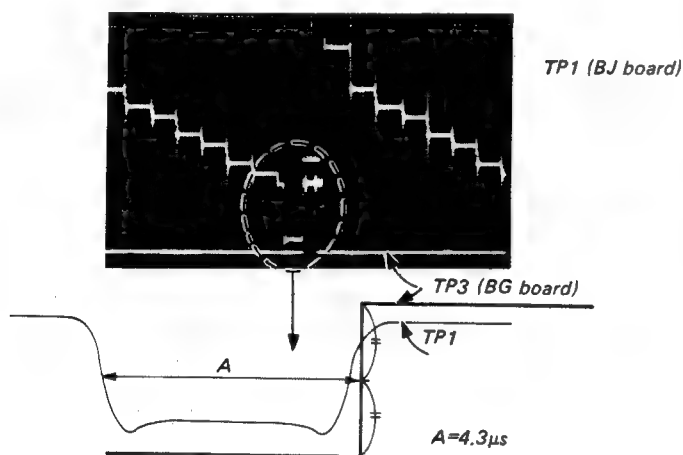
* Adjust (A), from SYNC fall to B.G.P. (BURST GATE PULSE) rise, to 4.3µs.

Fig. 7-1

4. Adjust RV4 of BJ board so that the burst gate pulse width is 3.9 µs as shown in Fig. 7-2.

3.9 µs

3.9 µs

Fig. 7-2

BJ board

TP3
RV8

RV4

BG board

TP1 Y
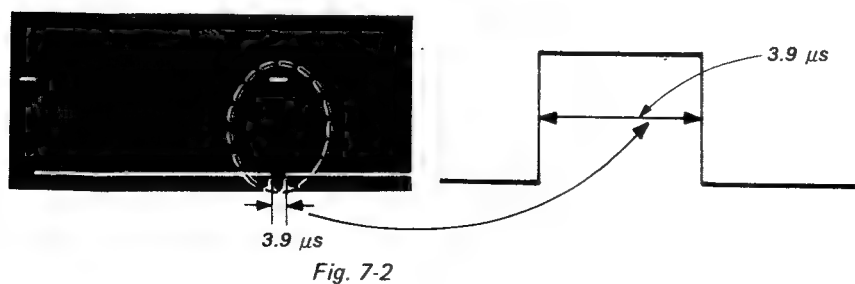
4-32

8. BC Board BPF ADJUSTMENT (BVM-1911 ONLY)

Tektronix 1410 Generator

SWEEP signal

VIDEO A terminal

75Ω terminator

BG board TP 2
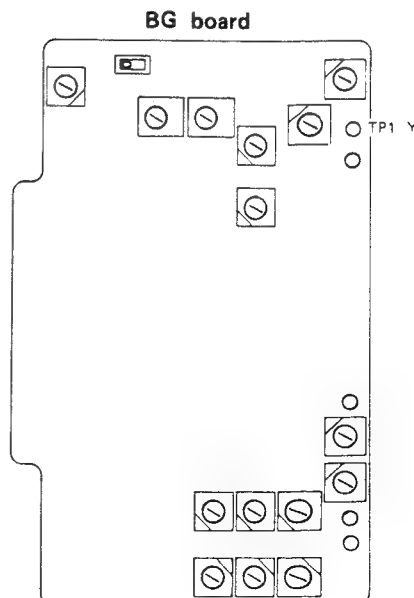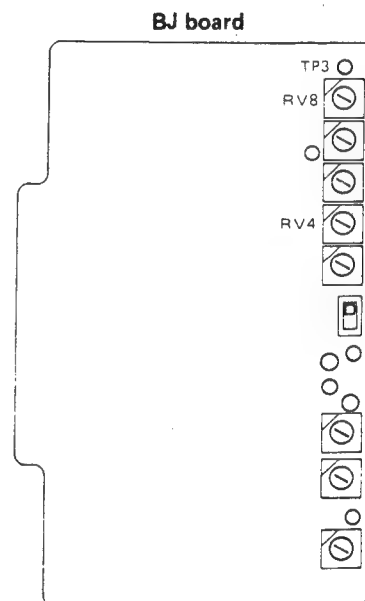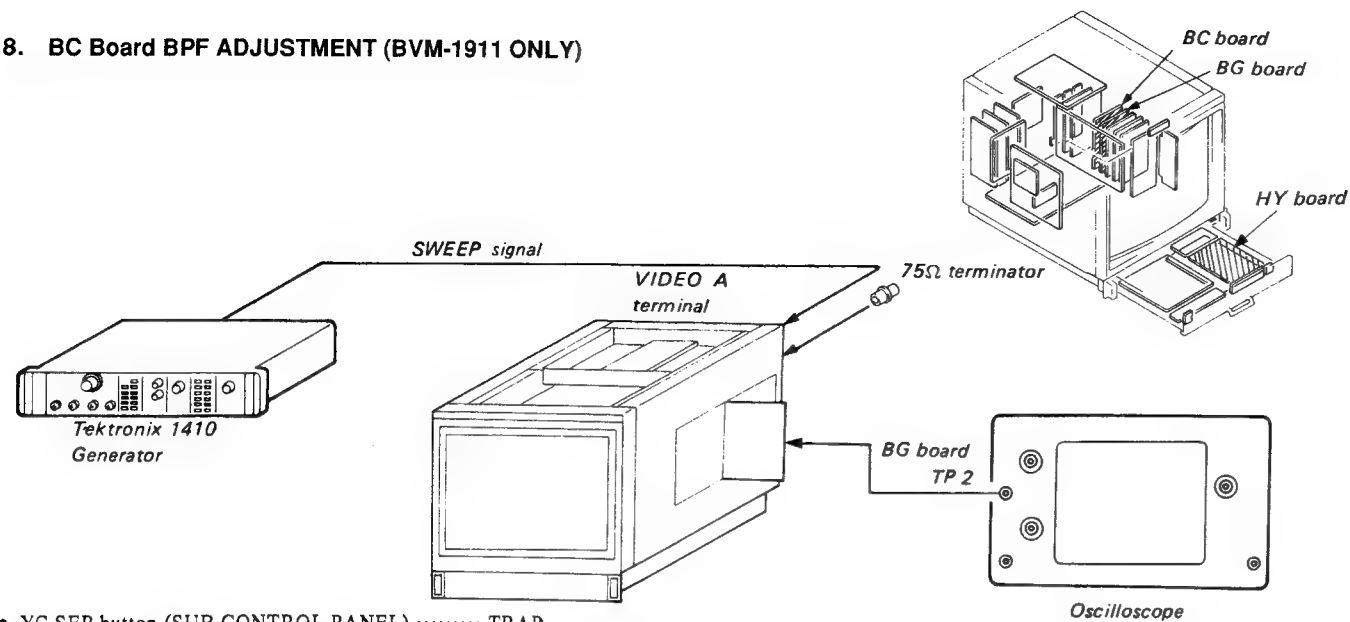
Oscilloscope

- YC SEP button (SUB CONTROL PANEL) ········ TRAP
1. Input SWEEP signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 on the BG board.
3. Make the V/dw of oscilloscope into VARIABLE, and match the upper section of waveform to 7 div as shown in Fig. 8-1.

7 div.
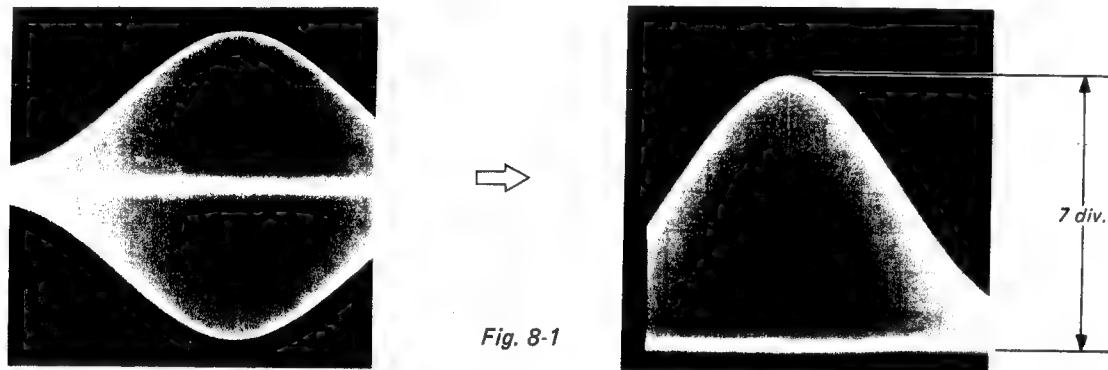
Fig. 8-1

4. Adjust L3 on the BC board so that A is equal to B as shown in Fig. 8-2.
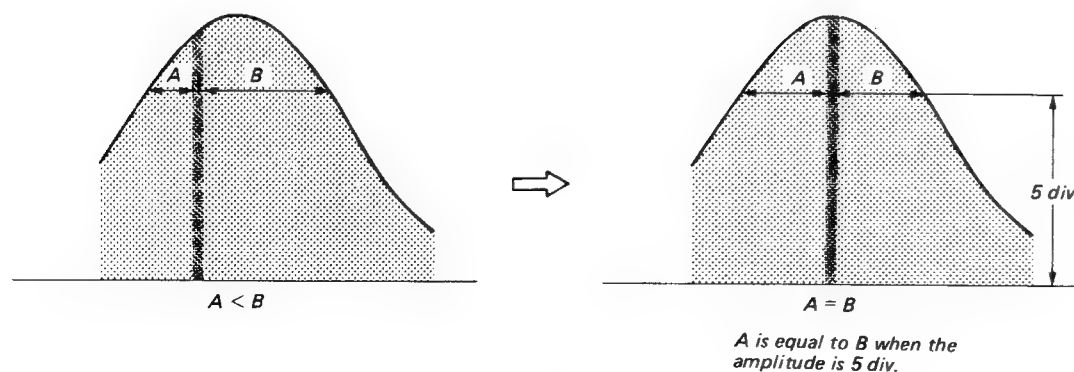
A < B

A = B

5 div

A is equal to B when the amplitude is 5 div.

Fig. 8-2

BC board

L3

BG board

TP2 R-Y

SUB CONTROL PANEL (HY board)

9. BC Board PHASE SHIFT ADJUSTMENT (BVM-1911 ONLY)

COMP SYNC signal

Color-bar signal (R-Y OFF)

BC board
BG board

HY board

75Ω terminator

VIDEO A terminal

Attenuator

EXT SYNC terminal

BG board TP2

Tektronix 1410 Generator

*Color-bar signal
(FULL FIELD R-Y off
7.5% set up
100 IRE
75% AMPL)

Oscilloscope
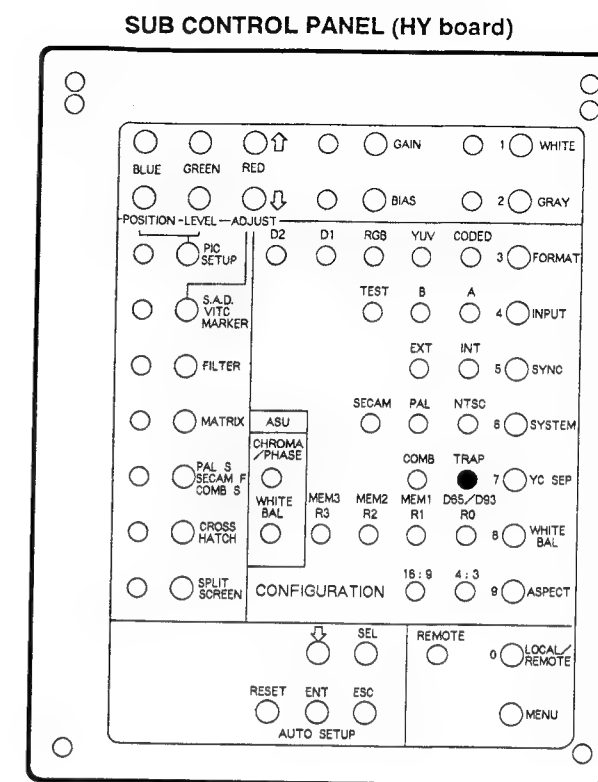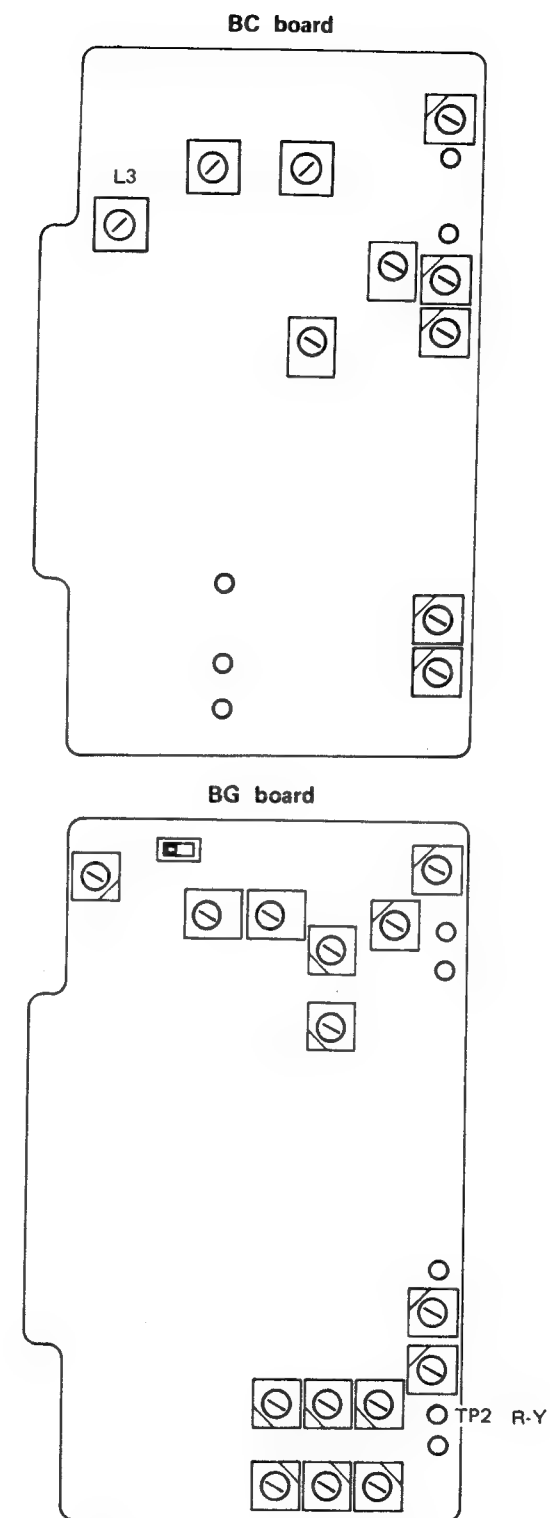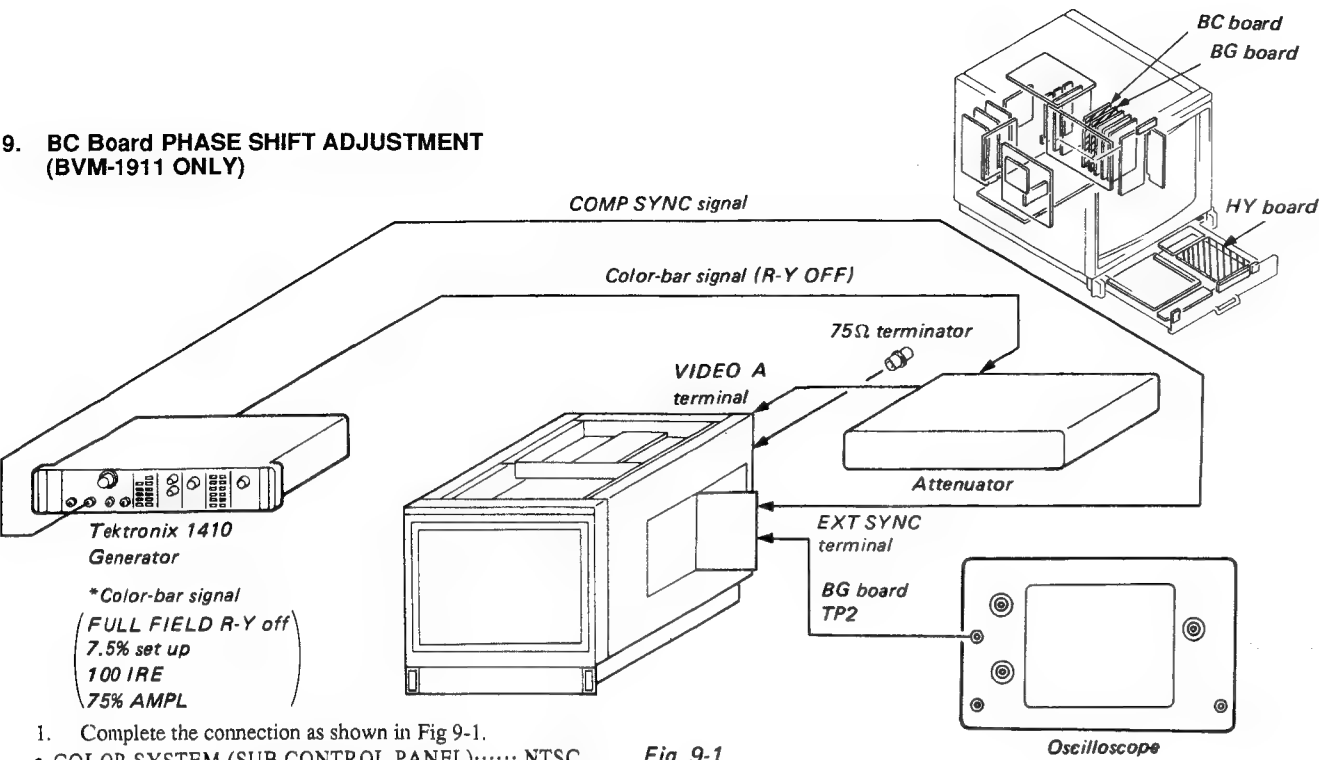
Fig. 9-1

1. Complete the connection as shown in Fig 9-1.
   - COLOR SYSTEM (SUB CONTROL PANEL)······ NTSC
   - FORMAT button (SUB CONTROL PANEL)··········CODED
   - YC SEP button (SUB CONTROL PANEL) ········ TRAP
   - SYNC button (SUB CONTROL PANEL)············ EXT
2. Connect an oscilloscope to the TP2 on the BG board.
3. Make the waveform flat with the PHASE control of front panel as shown in Fig. 9-2.

4. Attenuate the signal by 10dB by using attenuator.
5. Adjust RV3 on the BC board so that the output waveform becomes flat as shown in Fig. 9-2.
6. Restore the attenuator to 0dB.
7. Repeat the steps 3 to 5.

Fig. 9-2

PHASE control

FRONT PANEL

AUTO SET UP PROBE

DEGAUSS

SCAN MODE

SCREEN

APER-TURE BLUE ONLY MONO MODE

PHASE CHROMA BRIGHTNESS CONTRAST OVER LOAD

INPUT 1 2

POWER

MANUAL 3 4

PHASE MANUAL SW PRE

BC board

RV3

SUB CONTROL PANEL (HY board)

BG board

TP2 R-Y
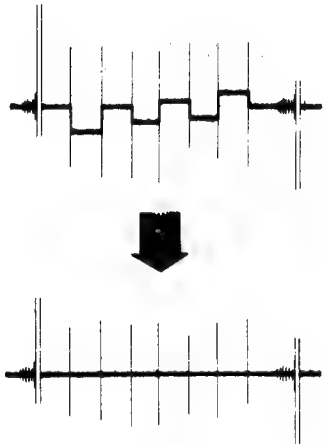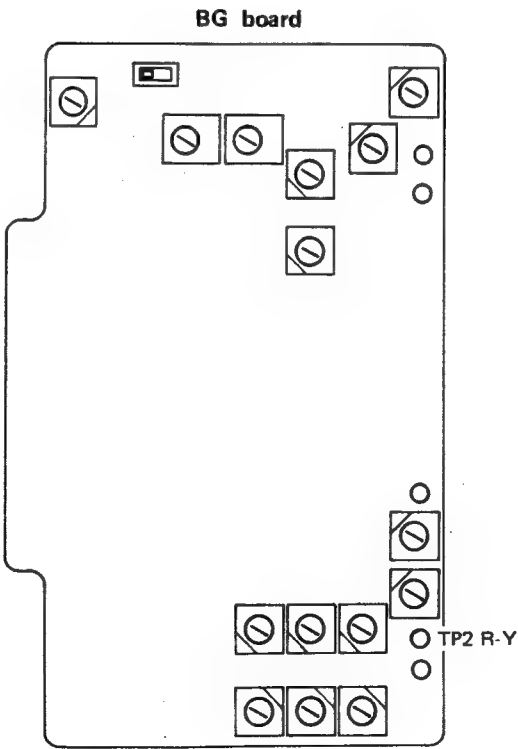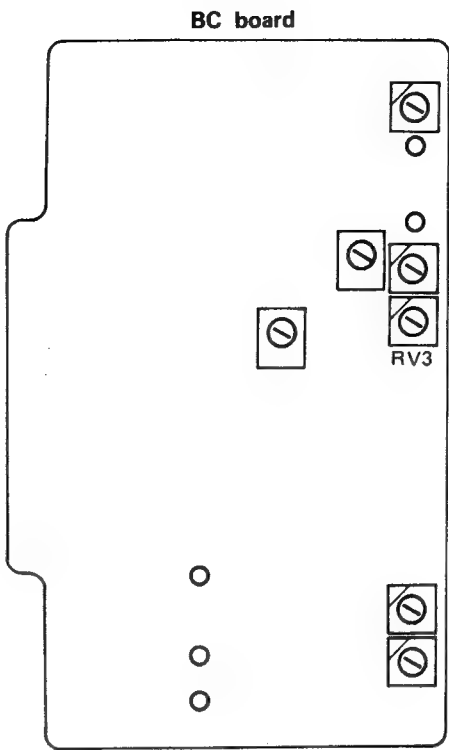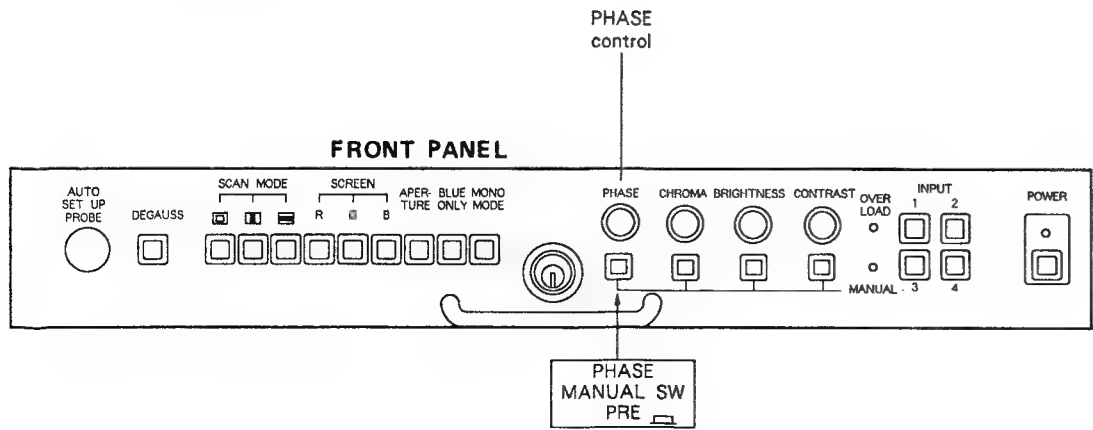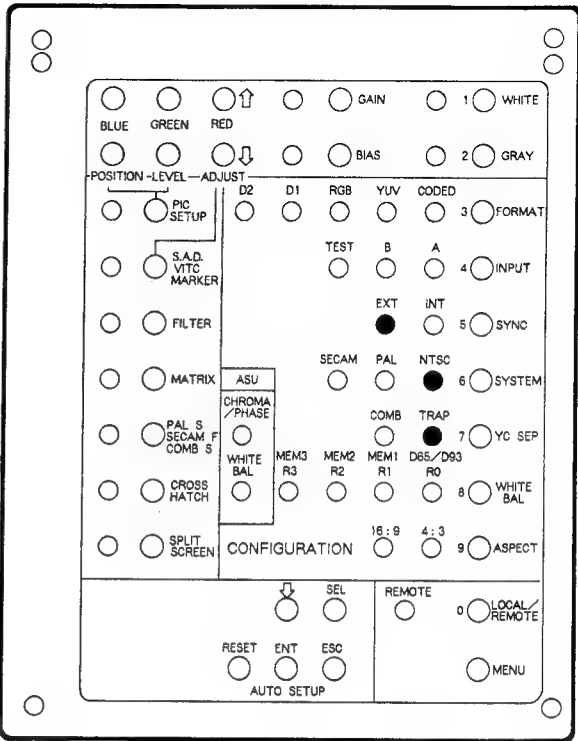
10. BC Board 3.58MHz fo ADJUSTMENT (BVM-1911 ONLY)
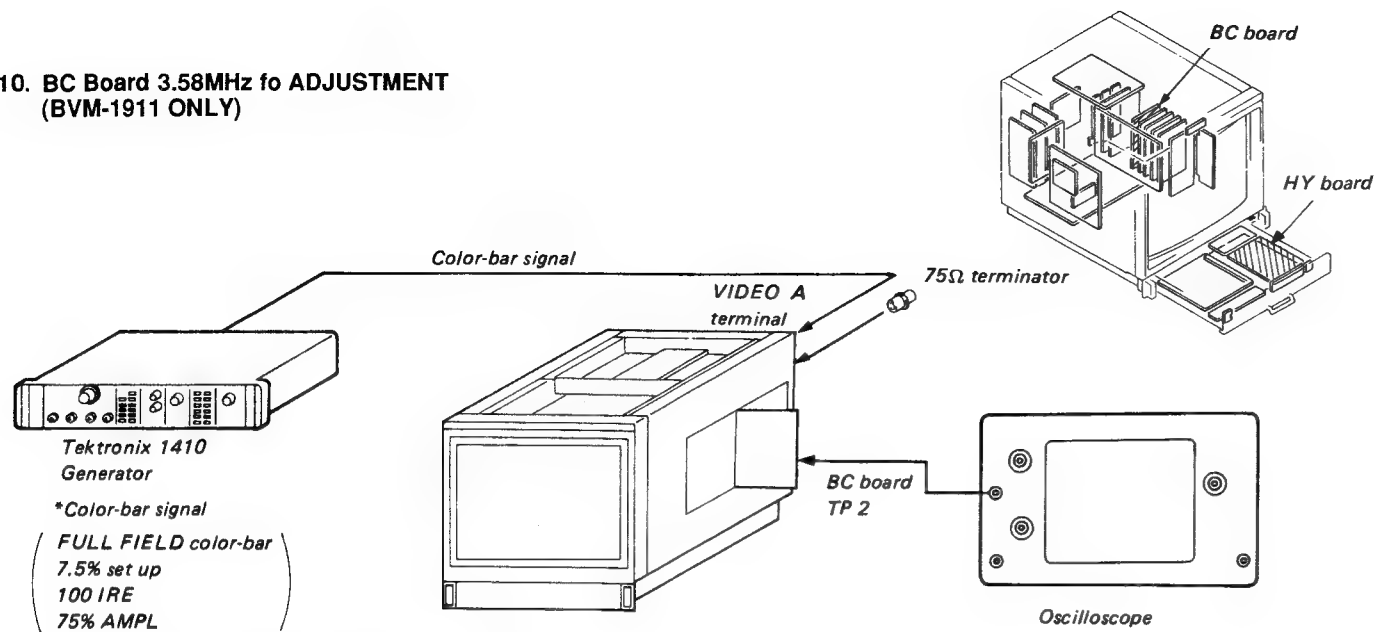
Color-bar signal

VIDEO A terminal

75Ω terminator

BC board

HY board

Tektronix 1410 Generator

*Color-bar signal

FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL

BC board TP 2

Oscilloscope

- YC SEP button (SUB CONTROL PANEL) ········ TRAP
1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 of BC board.
3. Short-circuit between TP6 and TP7 of BC board with a jumper wire.
4. Adjust CV2 of BC board so that the output waveform is shifted slowly as shown in Fig. 10-1.
5. Turn off the power of this monitor, and disconnect TP6 and TP7 of BC board.

TP2 on the BC board

Adjust the output waveform
to be shifted slowly
as if it stop.
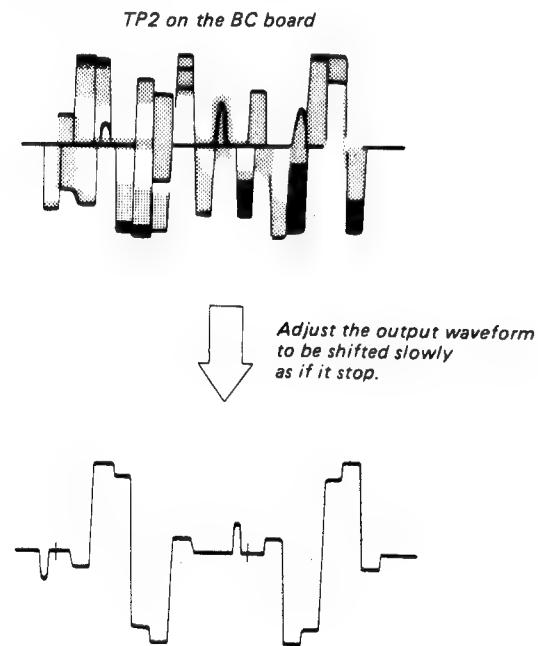
Fig. 10-1

SUB CONTROL PANEL (HY board)

BLUE GREEN RED ⇑ GAIN WHITE 1
⇓ BIAS GRAY 2
-POSITION -LEVEL—ADJUST-
PIC SETUP D2 D1 RGB YUV CODED FORMAT 3
S.A.D. VITC MARKER TEST B A INPUT 4
FILTER EXT INT SYNC 5
MATRIX ASU SECAM PAL NTSC SYSTEM 6
PAL S SECAM F COMB S CHROMA /PHASE COMB TRAP YC SEP 7
CROSS HATCH WHITE BAL MEM3 R3 MEM2 R2 MEM1 R1 D65/D93 R0 WHITE BAL 8
SPLIT SCREEN CONFIGURATION 16:9 4:3 ASPECT

SEL REMOTE LOCAL/ REMOTE 0
RESET ENT ESC MENU
AUTO SETUP

BC board

CV2

TP6

Jumper

TP7

TP2
R-Y OUT

TP5
GND

11. BC Board COLOR DIFFERENCE PHASE ADJUSTMENT (BVM-1911 ONLY)

Color-bar signal

Tektronix 1410 Generator

1V (75Ω)

(FULL FIELD)

VIDEO A terminal

75Ω terminator

BG board TP3 TP2

Oscilloscope
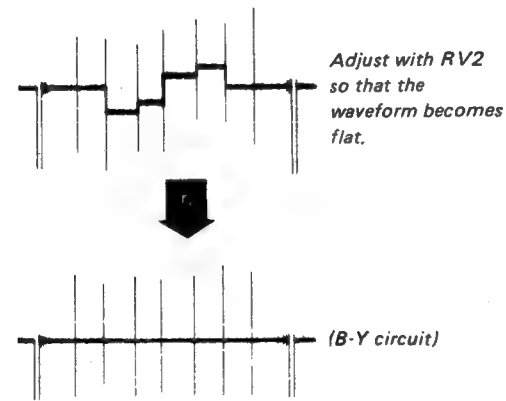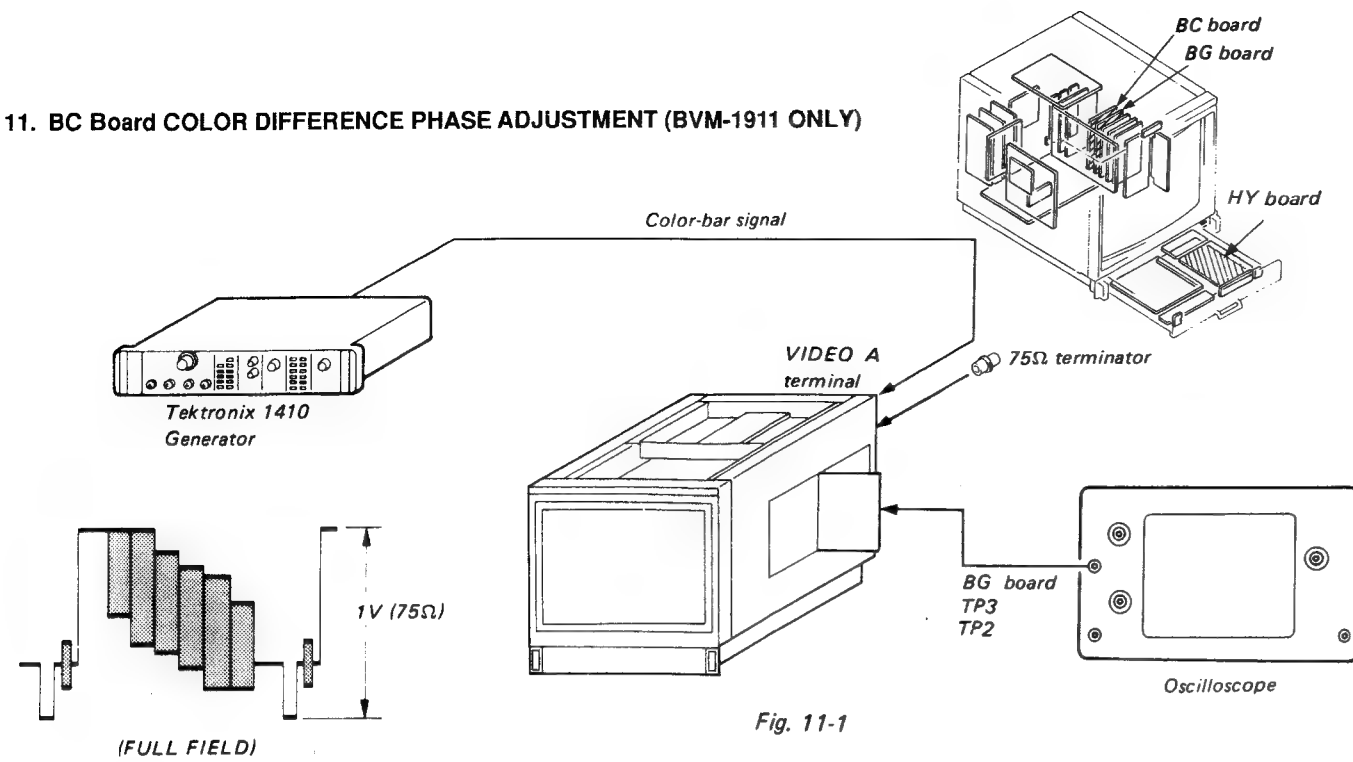
Fig. 11-1

- YC SEP button (SUB CONTROL PANEL) ········ TRAP
1. Complete the connections as shown in Fig. 11-1.
2. Turn on the power of this monitor.

| B-Y System Adjustment |

3. Connect the oscilloscope probe to TP3 on the BG board, and turn off the (B-Y) signal of the signal generator.
4. Set the oscilloscope sensitivity to 20mV/DIV, and adjust RV2 on the BC board so that the ouput waveform is flat. (See Fig. 11-2.)

Adjust with RV2 so that the waveform becomes flat.

(B-Y circuit)

Fig. 11-2

| Quad Adjustment |

5. Connect the oscilloscope probe to TP2 on the BG board. Turn on the B-Y signal of the signal generator, and turn off the (R-Y) signal. Then adjust CV1 on the BC board so that the output waveform is flat. (See Fig. 11-3)
6. Repeat the steps 3 to 6.

Adjust with CV1 so that the waveform becomes flat.

(R-Y circuit)

Fig. 11-3
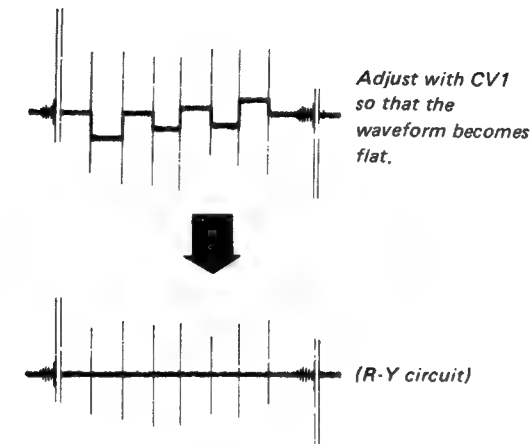
SUB CONTROL PANEL (HY board)

BC Board

RV2
CV1

BG Board

TP3
B-Y
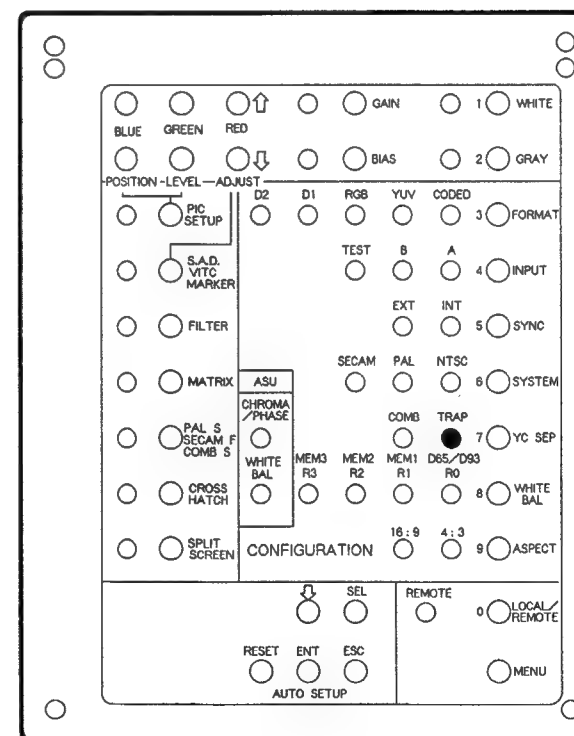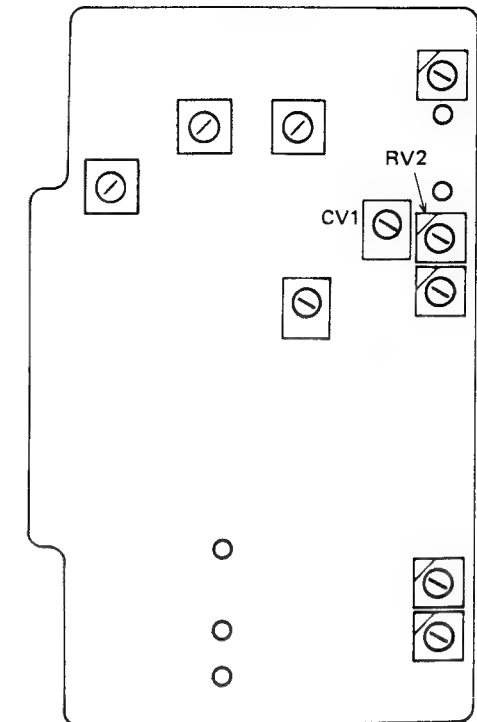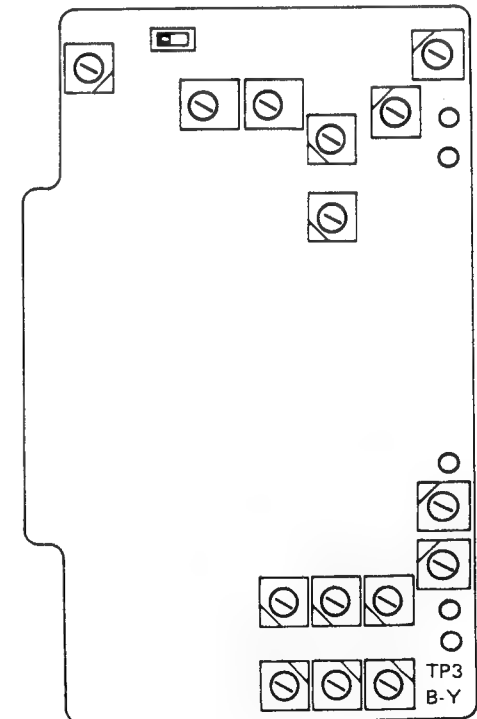
12. BC Board COLOR DIFFERENCE LEVEL ADJUSTMENT (BVM-1911 ONLY)
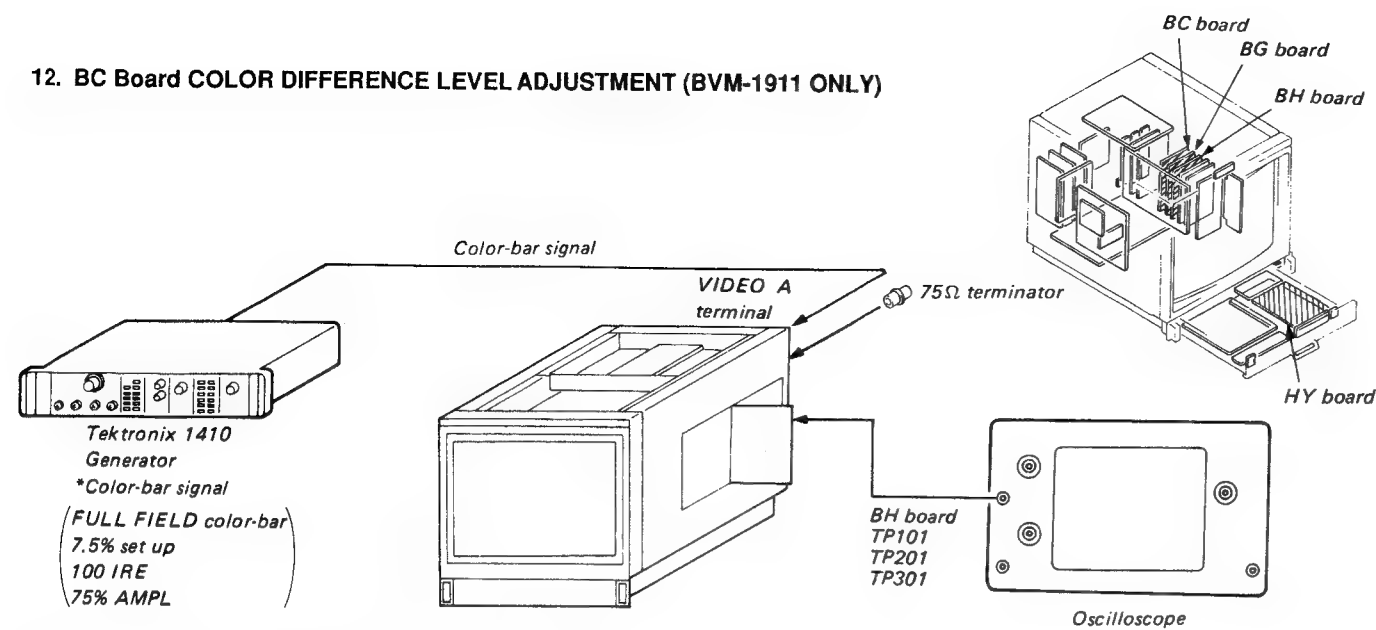
Color-bar signal

VIDEO A terminal

75Ω terminator

Tektronix 1410 Generator

*Color-bar signal

(FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL)

BC board
BG board
BH board

HY board

BH board
TP101
TP201
TP301

Oscilloscope

• YC SEP button (SUB CONTROL PANEL) ·········· TRAP

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP101 of BH board.
3. Adjust RV4 of BC board so that the levels with ÷ is flat as shown in Fig. 12-1.
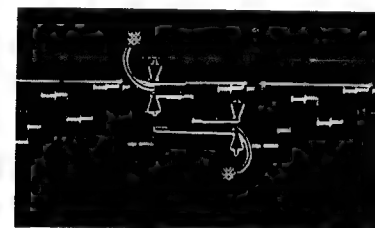
* Adjust the levels with ÷ to be flat respectively useing RV4 of BC board.

TP101 R OUT

Fig. 12-1

4. Connect an oscilloscope to the TP301 of BH board.
5. Adjust RV5 of BC board so that the output waveform as shown in Fig. 12-2.

TP301 B OUT

Make flat
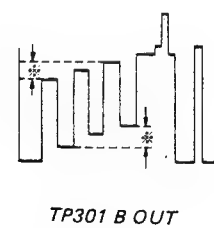
Make flat
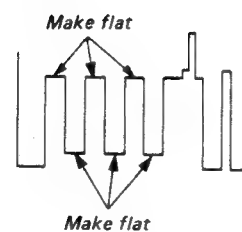
Fig. 12-2

6. Connect an oscilloscope to the TP201 of BH board.
7. Adjust RV4 and RV5 of BG board so that the INPUT waveform becomes flat as shown in Fig. 12-3.

TP201 G OUT

RV4

RV5

Fig. 12-3

BG board

RV5

RV4

BC Board

RV4

RV5

BH Board

TP101 R OUT
TP201 G OUT
TP301 B OUT
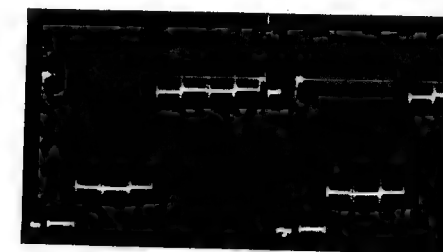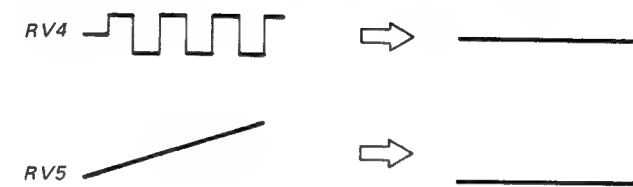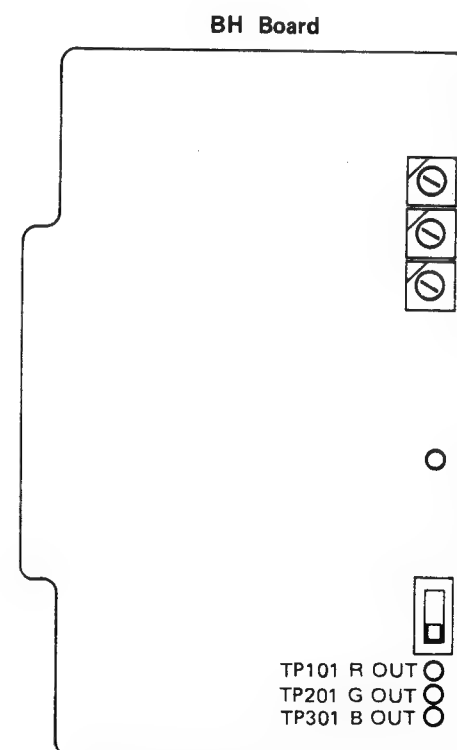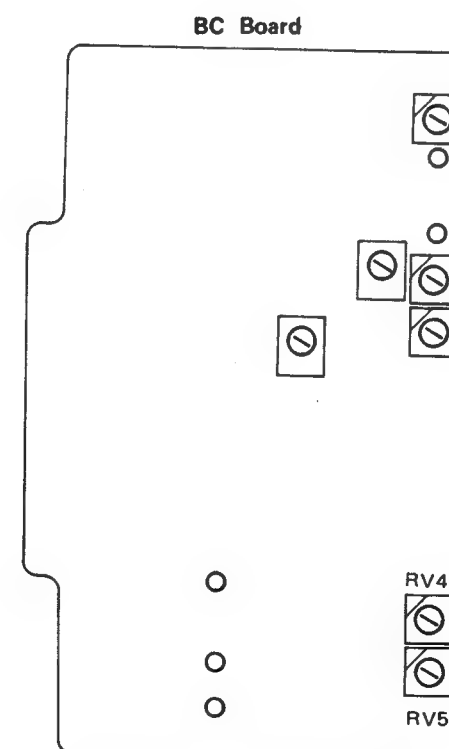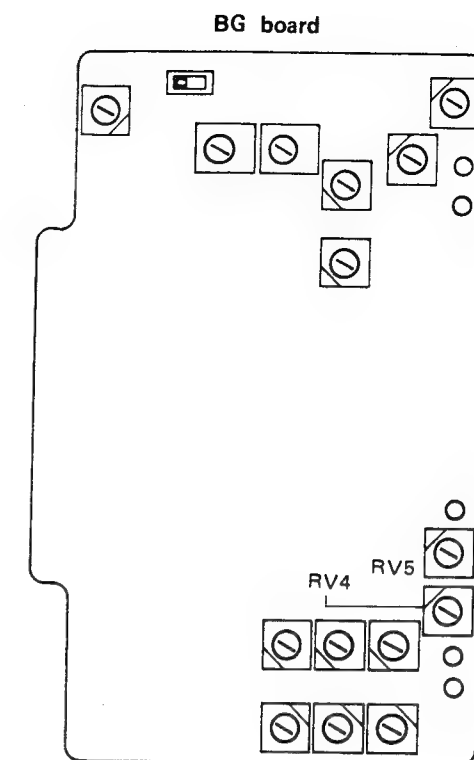
13. BC Board Y TRAP ADJUSTMENT (BVM-1911 ONLY)

Tektronix 1410
Generator
*Color-bar signal
(FULL FIELD color-bar)
7.5% set up
100 IRE
75% AMPL

color-bar signal
VIDEO A terminal
75Ω terminator
BC board
BG board
HY board
BG board TP 1
Oscilloscope
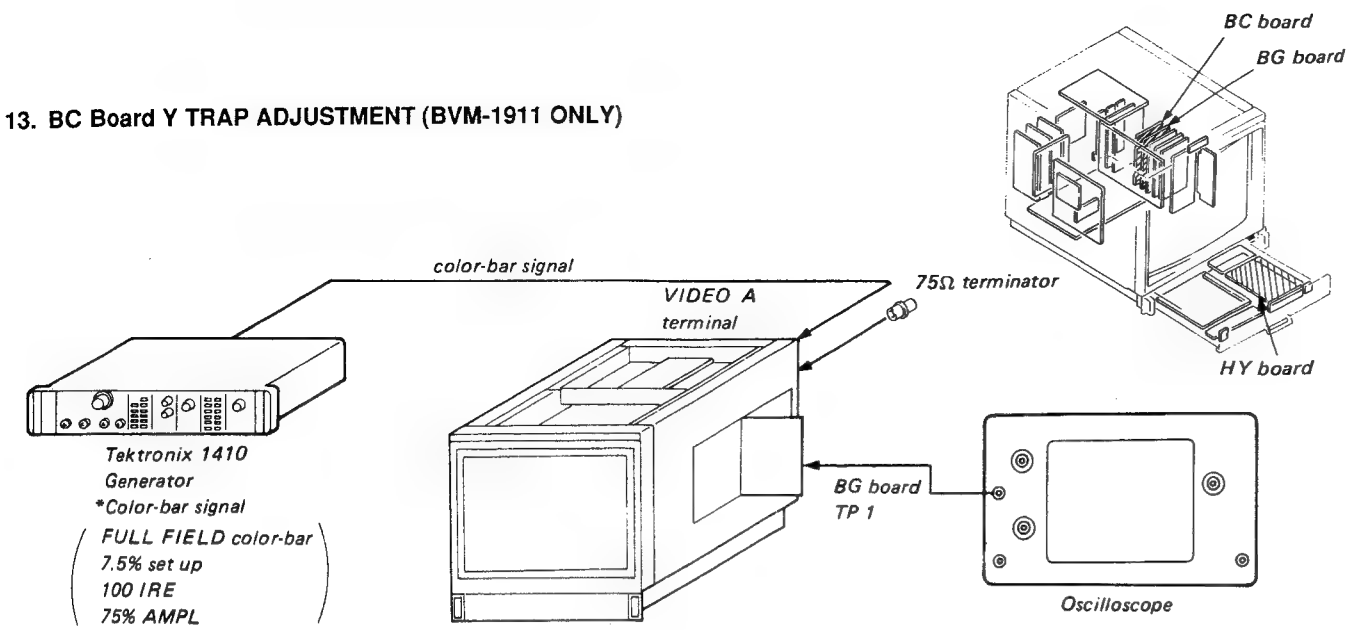
• COLOR SYSTEM button
(SUB CONTROL PANEL)·······························NTSC
• YC SEP button (SUB CONTROL PANEL) ·········TRAP
1. Input color-bar signal to VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L1 of BC board so that 3.58MHz subcarrier is minimum as shown in Fig. 13-1.
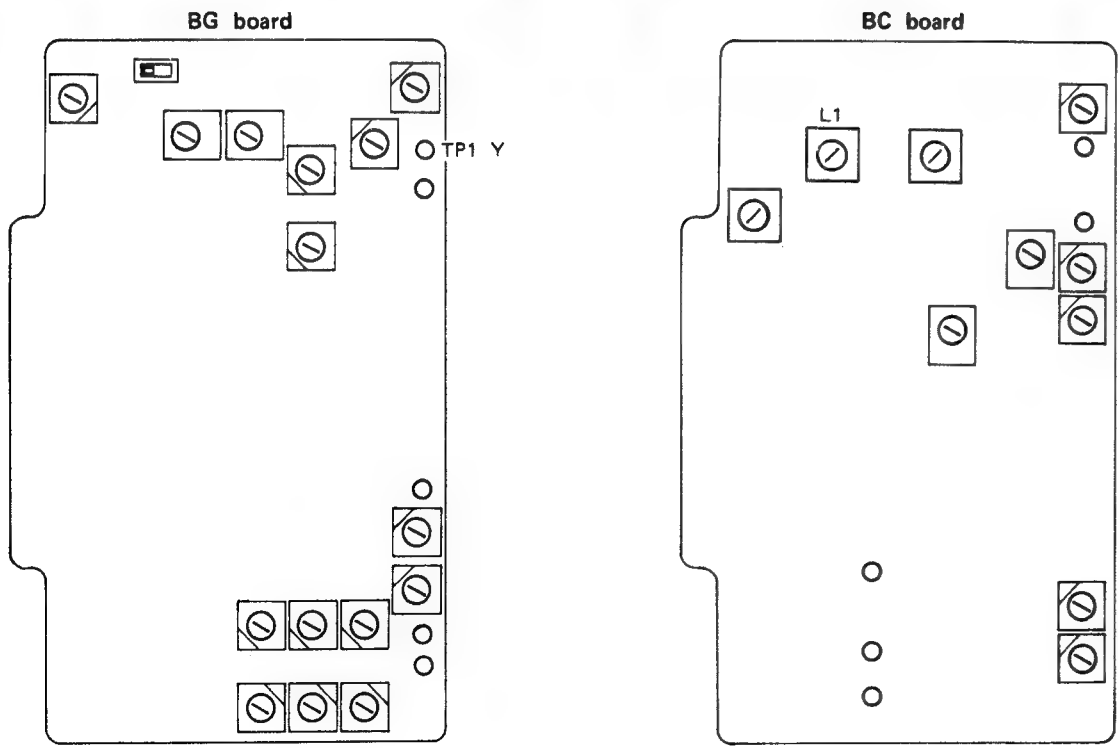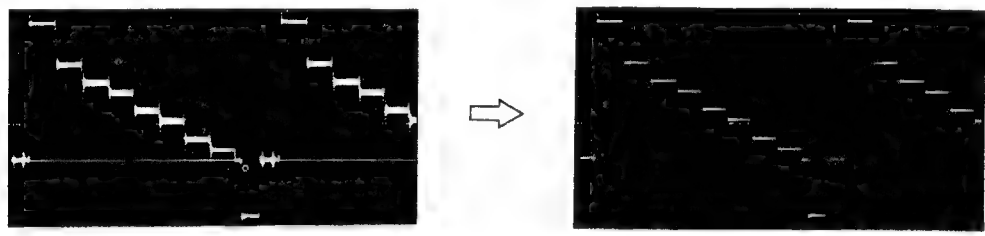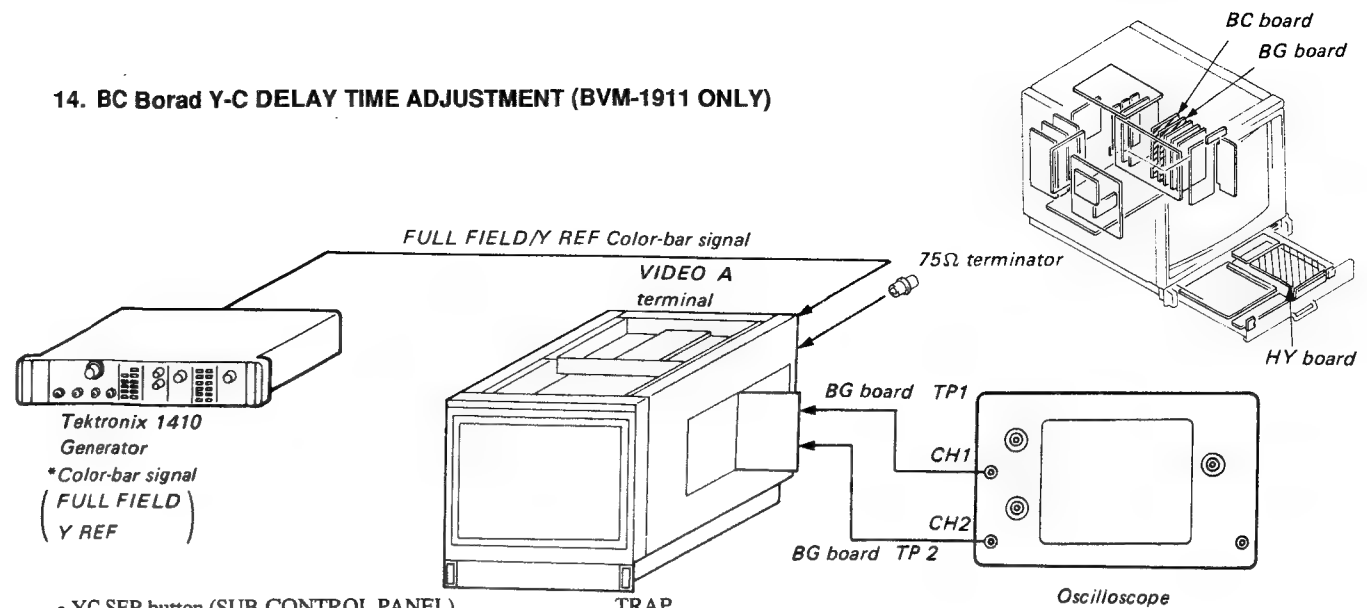
Fig. 13-1

BG board

BC board

4-43

14. BC Borad Y-C DELAY TIME ADJUSTMENT (BVM-1911 ONLY)

Tektronix 1410
Generator
*Color-bar signal
(FULL FIELD)
Y REF

FULL FIELD/Y REF Color-bar signal
VIDEO A terminal
75Ω terminator
BC board
BG board
HY board
BG board TP1
CH1
CH2
BG board TP 2
Oscilloscope

• YC SEP button (SUB CONTROL PANEL)·······························TRAP
1. Input color-bar signal (FULL FIELD/Y REF) to the VIDEO A terminal of the set.
2. Connect an oscilloscope (CH-1 probe) to the TP1 of BG board and connect an oscilloscope (CH-2 probe) to the TP2 of BG board (VERT mode of the oscilloscope is CHOP).
3. Adjust RV1 of BC board so that the output waveform as shown in Fig. 14-1.

TP2 (R-Y)
TP1 (Y)
$\begin{pmatrix} A=B \\ C=D \end{pmatrix}$
C = D
A = B

Fig. 14-1

Adjust RV1 so that E is equal to F.
TP2 (R-Y)
E = F
TP1 (Y)
E = F

BG Board

TP1 Y
TP2 R-Y

BC Board

RV1

4-44
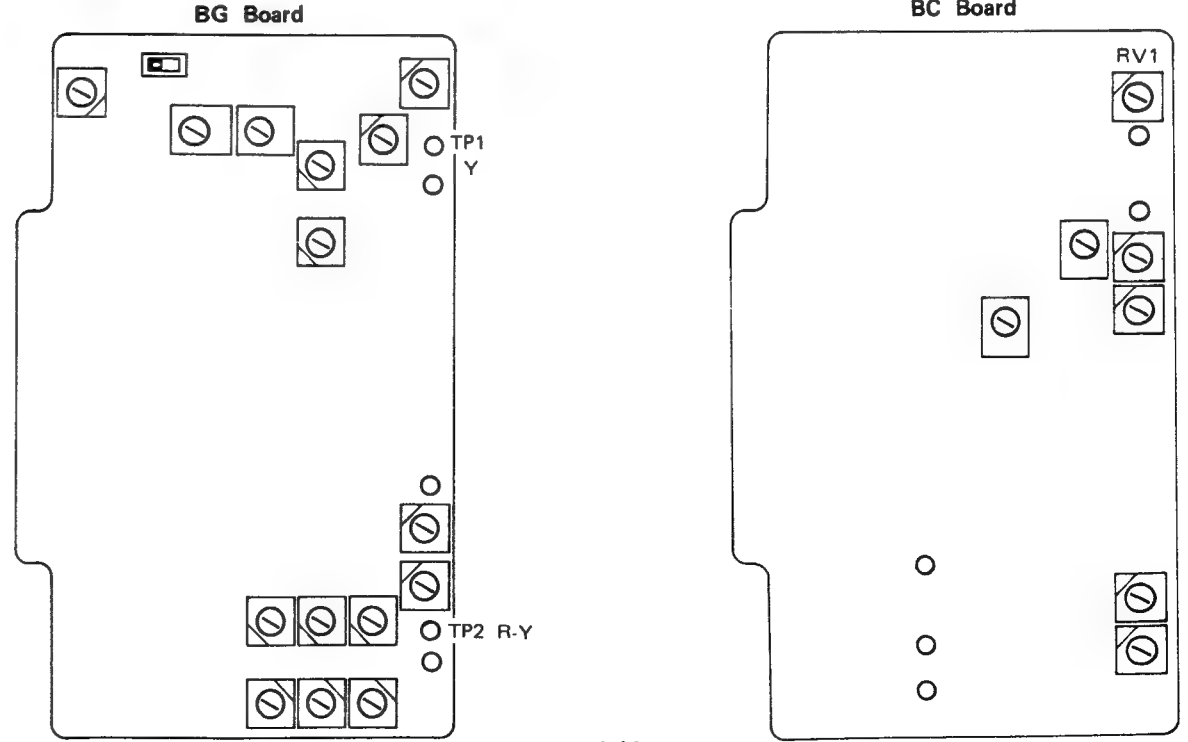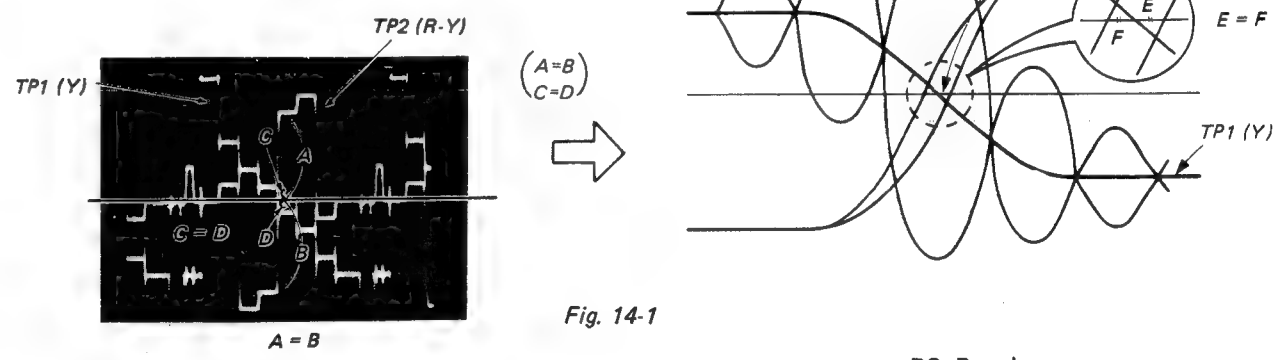
15. BC Board 2T PULSE CORRCTION ADJUSTMEN (BVM-1911 ONLY)

Tektronix 1410
Generator

VIDEO A
terminal

2T PULSE signal

75Ω terminator

BC board
BG board

HY board

BG board
TP 1
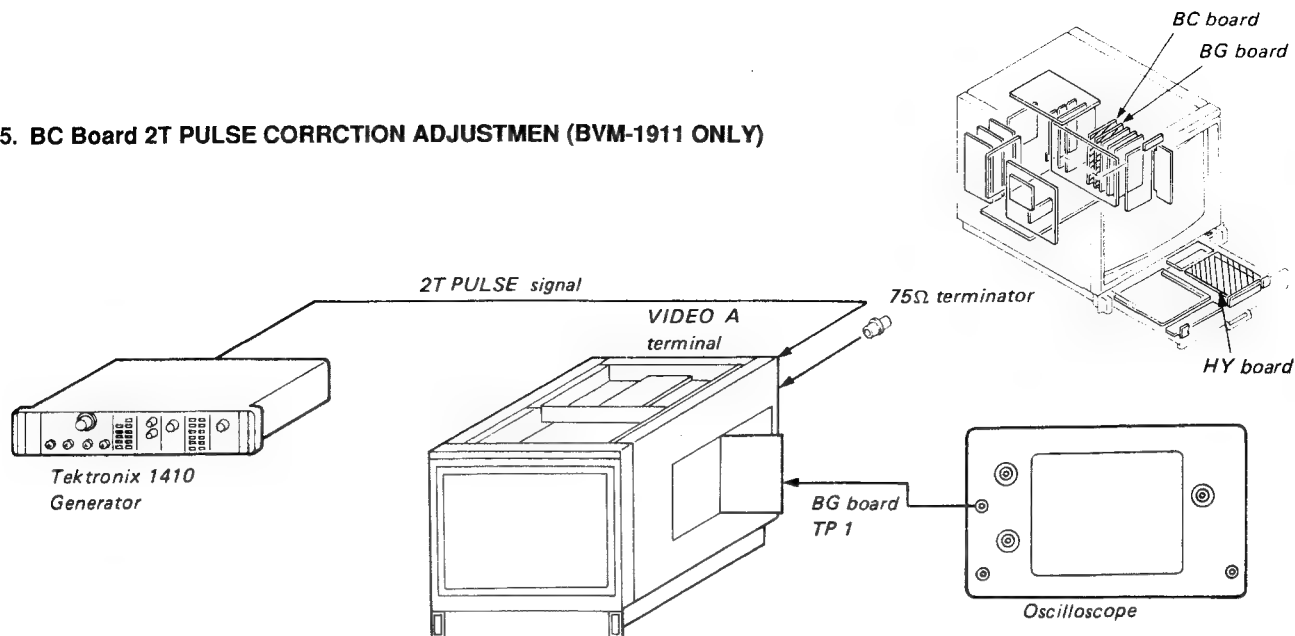
Oscilloscope

● YC SEP button (SUB CONTROL PANEL) ········· TRAP

1. Input 2T pulse signal to VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L2 of BC board so that A is equal to B as shown in Fig. 15-1.
4. Change the input signal from 2T pulse to T pulse, and make sure the waveform balance is not lost extremely as shown in Fig. 15-1.
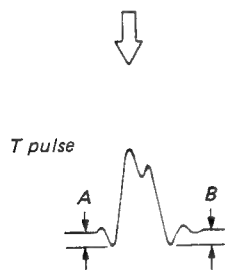
2T pulse

A   B

* Adjust L2 to obtain
  the condition A = B.

* The waveform balance
  should not be lost
  extremely.

T pulse

A   B

Fig. 15-1

BC board

L2

BG board

TP1 Y
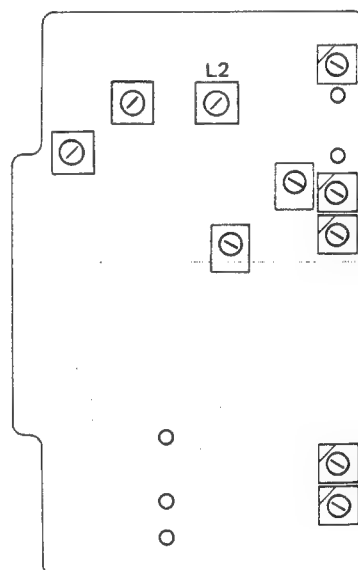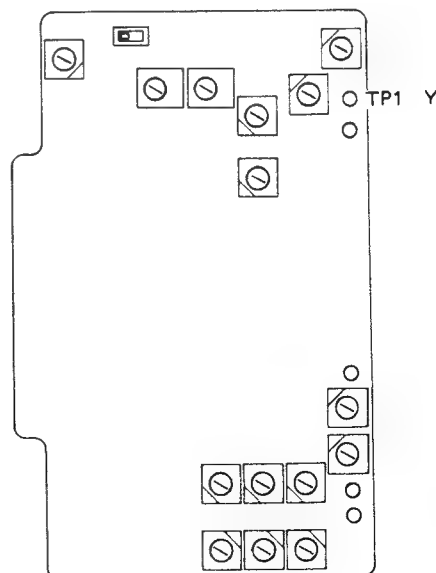
16. BJ Board INTERLACE ADJUSTMENT
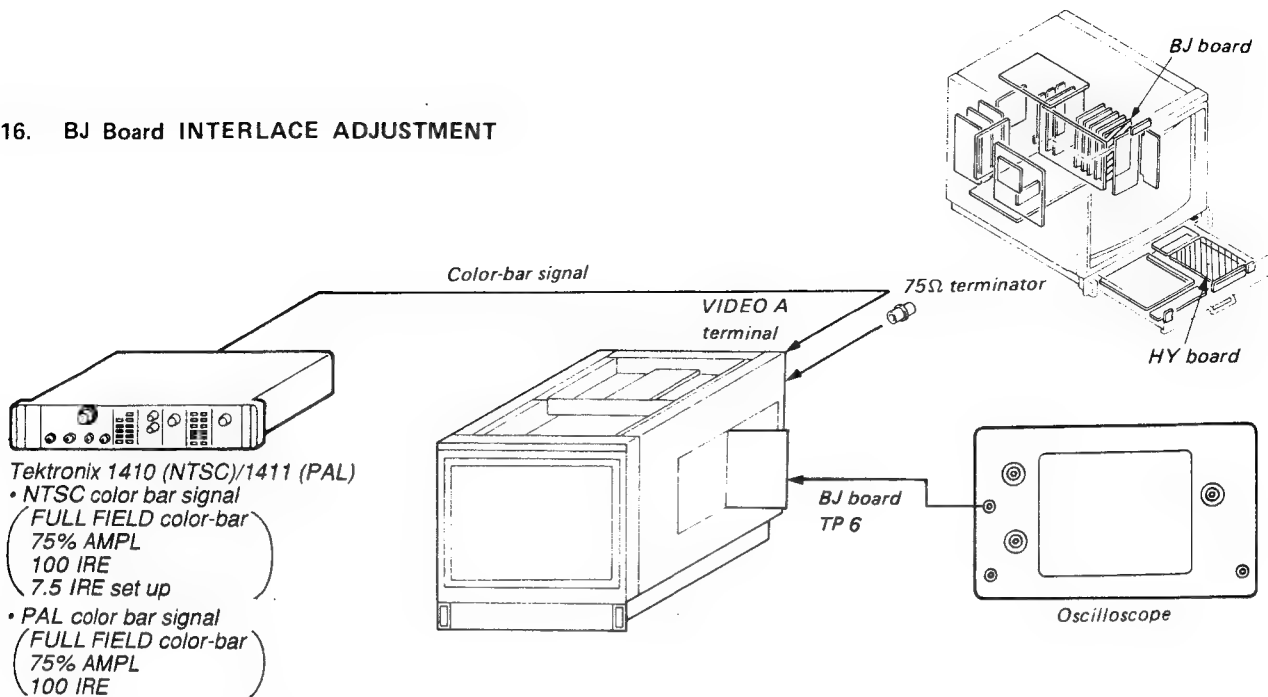
BJ board

HY board

Color-bar signal

VIDEO A terminal

75Ω terminator

Tektronix 1410 (NTSC)/1411 (PAL)
• NTSC color bar signal
  ⎛ FULL FIELD color-bar ⎞
  ⎜ 75% AMPL ⎟
  ⎜ 100 IRE ⎟
  ⎝ 7.5 IRE set up ⎠
• PAL color bar signal
  ⎛ FULL FIELD color-bar ⎞
  ⎜ 75% AMPL ⎟
  ⎝ 100 IRE ⎠

BJ board
TP 6

Oscilloscope

• YC SEP button (SUB CONTROL PANEL) ········ TRAP
1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP6 on the BJ board.
3. Adjust RV6 to obtain the waveform on the oscilloscope as shown in Fig. 16-1.

A=B

Fig. 16-1

BJ board

TP6

RV6

4. ADJUSTMENTS

4-46

17. BK Board FREQUENCY CHARATERISTIC ADJUSTMENT

C board

BK board

HY board

Sweep signal

COMP SYNC signal

EXT SYNC terminal

75Ω terminator

COMP SYNC

Tektronix 1410
Generator

C board
TP1
TP2
TP3

100:1

Oscilloscope
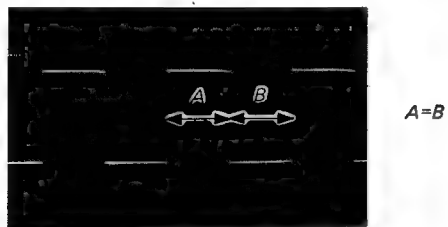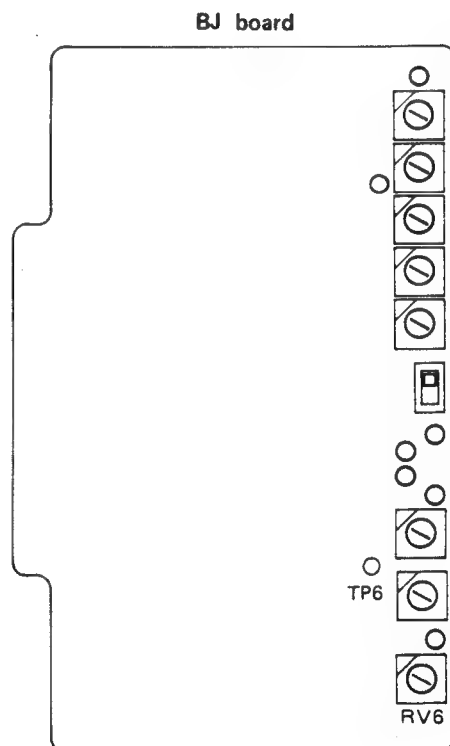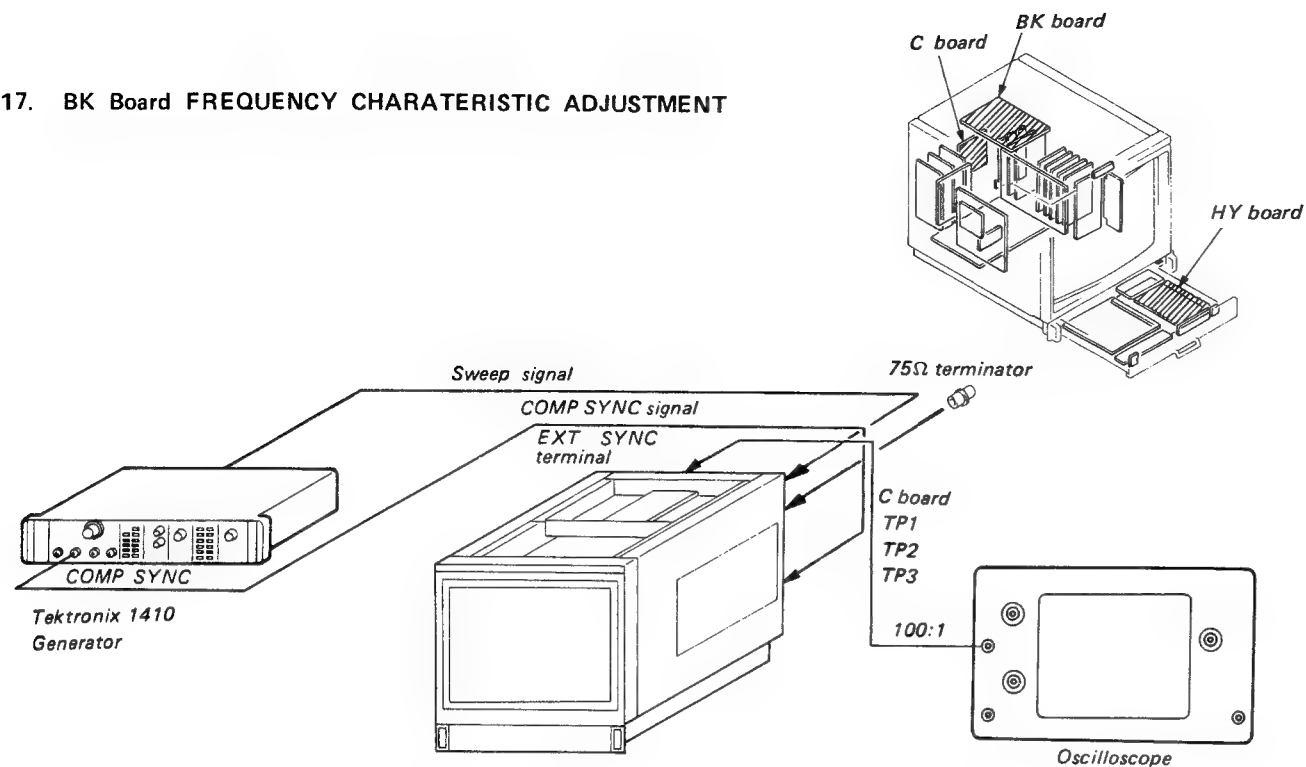
1. Input SWEEP signal to VIDEO A terminal of the set, and input COMP SYNC signal to EXT SYNC terminal of the set.
   - YC SEP button (SUB CONTROL PANEL) ··· TRAP
     (BVM-1911) (BVM-2011P)
   - SYNC button (SUB CONTROL PANEL) ····· EXT
   - MODE selector (FRONT PANEL) ············ MONO (▭)
   - FILTER button (SUB CONTROL PANEL) ··· OFF
2. Connect an oscilloscope to the TP1 on the C board.
   *Probe: 100:1
3. Adjust CV101 and CV102 on the BK board so that output waveform becomes flat in a range of 0 to 10MHz as shown in Fig. 17-1.
4. Connect an oscilloscope to the TP2 on the C board.
5. Adjust CV201 and CV202 on the BK board so that output waveform becomes flat in a range of 0 to 10MHz as shown in Fig. 17-1.
6. Connect an oscilloscope to the TP3 on the C board.
7. Adjust CV301 and CV302 on the BK board so that output waveform becomes flat in a range of 0 to 10MHz as shown in Fig. 17-1.

10MHz

10MHz

Fig. 17-1

FRONT PANEL

AUTO SET UP PROBE | DEGAUSS | SCAN MODE | SCREEN R G B | APER-TURE BLUE ONLY MONO MODE | PHASE | CHROMA | BRIGHTNESS | CONTRAST | OVER LOAD | INPUT 1 2 | POWER

MANUAL 3 4

MODE selector
MONO ▭

4-47

SUB CONTROL PANEL (HY board)

BLUE GREEN RED   GAIN   1 WHITE

POSITION –LEVEL –ADJUST   BIAS   2 GRAY

PIC SETUP   D2 D1 RGB YUV CODED   3 FORMAT

S.A.D. VITC MARKER   TEST B A   4 INPUT

FILTER   EXT INT   5 SYNC

MATRIX ASU   SECAM PAL NTSC   6 SYSTEM

PAL S SECAM F COMB S   CHROMA /PHASE   COMB TRAP   7 YC SEP

WHITE BAL MEM3 R3 MEM2 R2 MEM1 R1 D65/D93 R0   8 WHITE BAL

CROSS HATCH

SPLIT SCREEN CONFIGURATION 16:9 4:3   9 ASPECT

SEL   REMOTE   0 LOCAL/REMOTE

RESET ENT ESC   MENU

AUTO SETUP

C board

TP1   TP2

TP3

BK board

CV101   CV102

CV201   CV202

CV301   CV302

4-48

18. BT Board COMB LILTER ADJUSTMENT (BVM-1911 ONLY)

18-1. BT Board Partial Adjustment
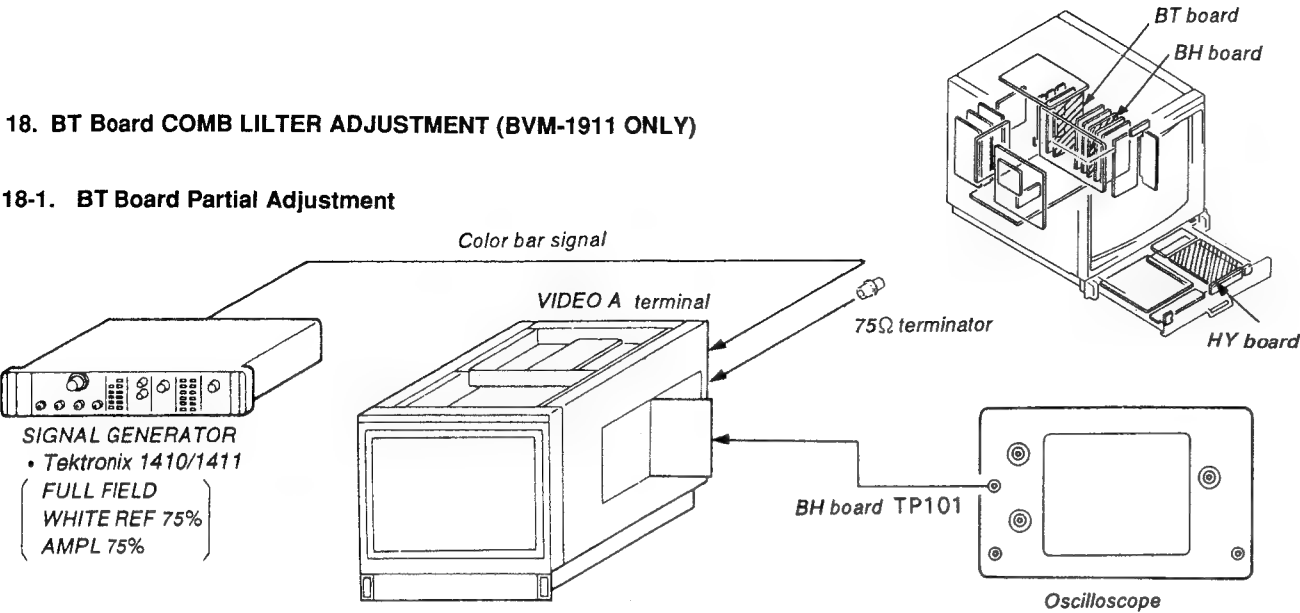
Luminance Level Adjustment

1. Feed a color bar signal to VIDEO A INPUT terminal of this set.
2. Set the YC SEP button on the sub control panel to TRAP position.
3. Connect the oscilloscope to TP101 (R OUT) on the BH board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope to set the portion A (white) of Fig. 18-1 to the center of the oscilloscope.
5. Set the YC SEP button on the sub control panel to the COMB position.
6. Set the PAL S/SECAM F/COMB S button on the sub control panel to the ON.
7. Set the portion A (white) of Fig. 18-1 to the center of the oscilloscope using RV3 (luminance level) on the BT board.

Chroma Level Adjustment

1. Feed a color bar signal to VIDEO A INPUT terminal of this set.
2. Set the YC SEP button on the sub control panel to the TRAP position.
3. Connect the oscilloscope to TP101 on the BH board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope to set the portion A (white) of Fig. 18-1 to the center of the oscilloscope.
5. Set the YC SEP button to the COMB position.
6. Set the PAL S/SECAM F/COMB S button on the sub control panel to the ON.
7. Set the portion B (red) of Fig. 18-1 to the center of the oscilloscope using RV8 (chroma level) on the BT board.
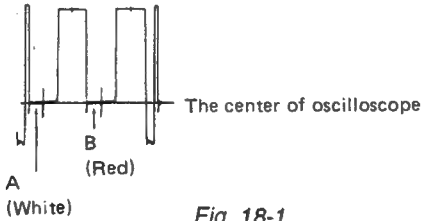
Fig. 18-1

Note: Never attempt to turn the following parts as these cannot be easily adjusted.
FL1, FL2, FL3, DL3, DL5, DL6, DL8

FRONT PANEL

BT board

BH board
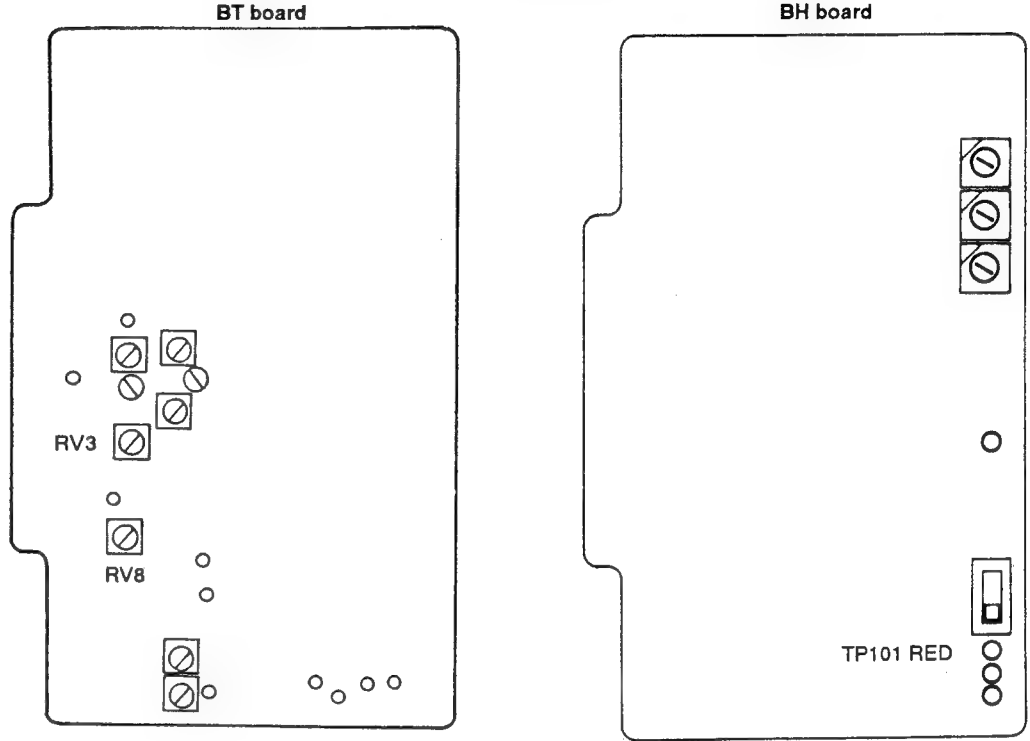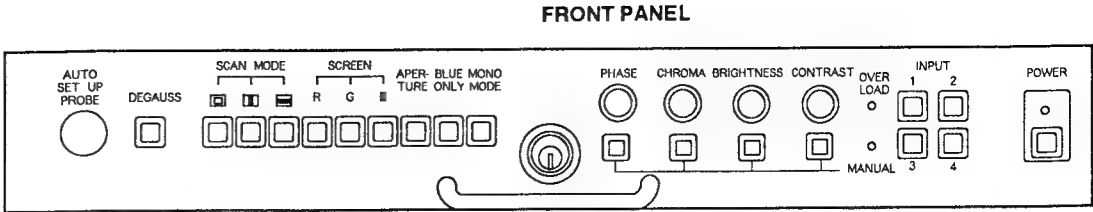
SUB CONTROL PANEL (HY board)
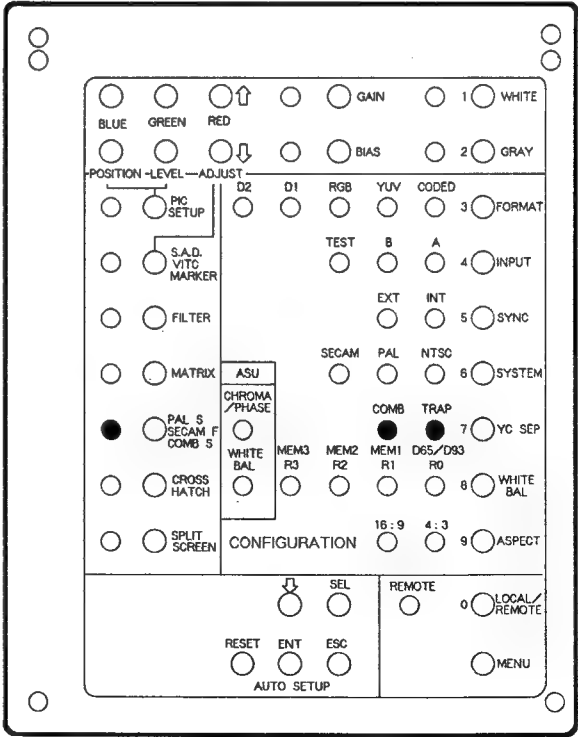
18-2. BT Board Total Adjustment

18-2-1. BT Board Luminance Level Adjustment
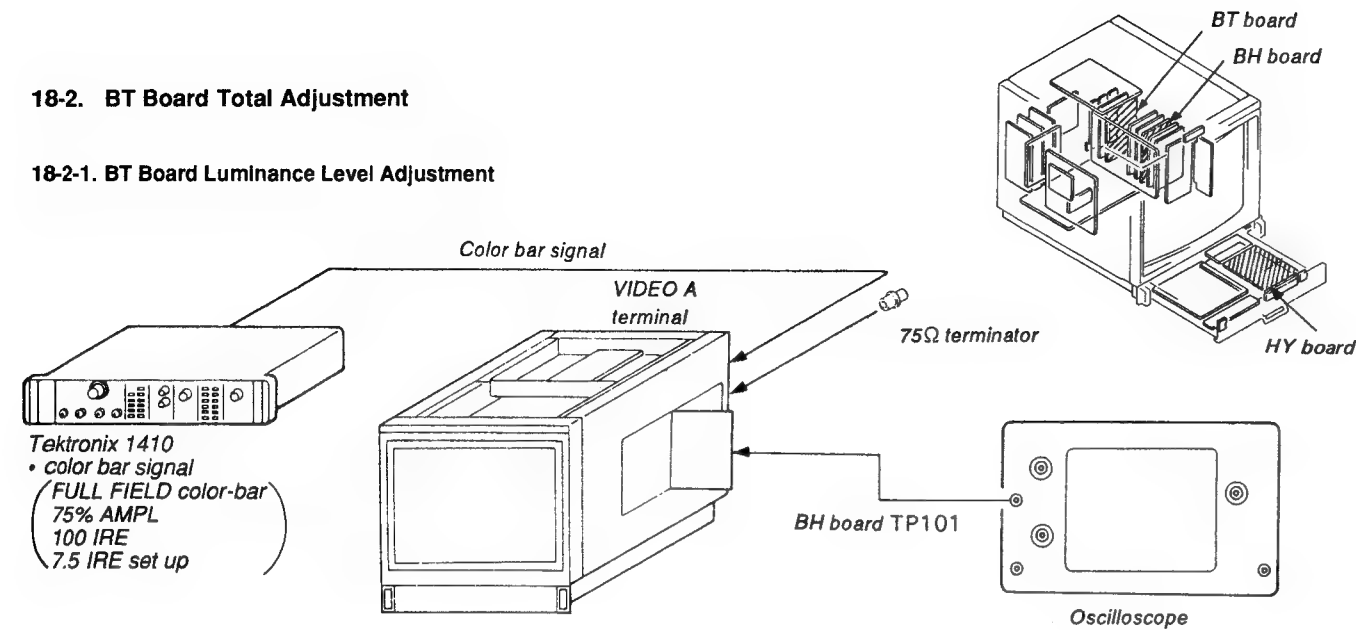
Color bar signal

VIDEO A terminal

75Ω terminator

BT board
BH board

HY board

Tektronix 1410
• color bar signal
/FULL FIELD color-bar\
75% AMPL
100 IRE
\7.5 IRE set up/

BH board TP101

Oscilloscope

1. Feed ■ color bar signal to VIDEO A INPUT terminal of this set.
2. Set the YC SEP switch on the sub control panel to the TRAP position.
3. Connect the oscilloscope to TP101 (R OUT) on the BH board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope until the portion A (white) of Fig. 18-2 is set to the center of the oscilloscope.
5. Set the YC SEP button to the COMB position.
6. Set the PAL S/SECAM F/COMB S button on the sub control panel to the ON.
7. Set the portion A (white) of Fig. 18-2 to the center of the oscilloscope using RV3 (luminance level) on the BT board.
8. Set the PAL S/SECAM F/COMB S button to the OFF.
9. Set the portion A (white) of Fig. 18-2 to the center of the oscilloscope using RV9 (1H luminance level) on the BT board.

The center of oscilloscope

B
(Red)

A
(White)

Fig. 18-2

FRONT PANEL

BH board

TP101 RED

BT board

RV3

RV9
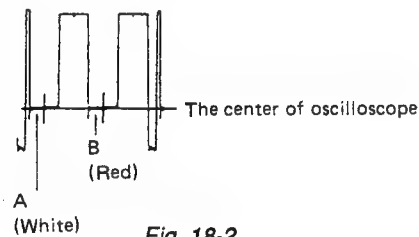
SUB CONTROL PANEL (HY board)
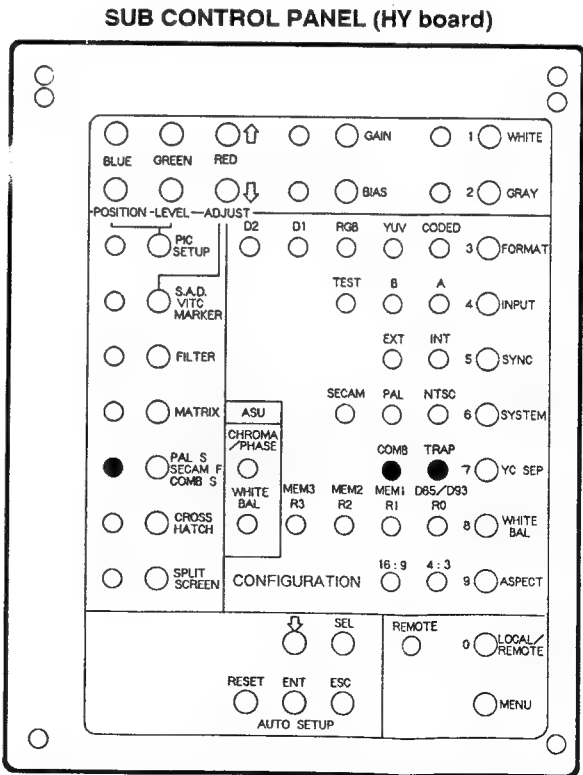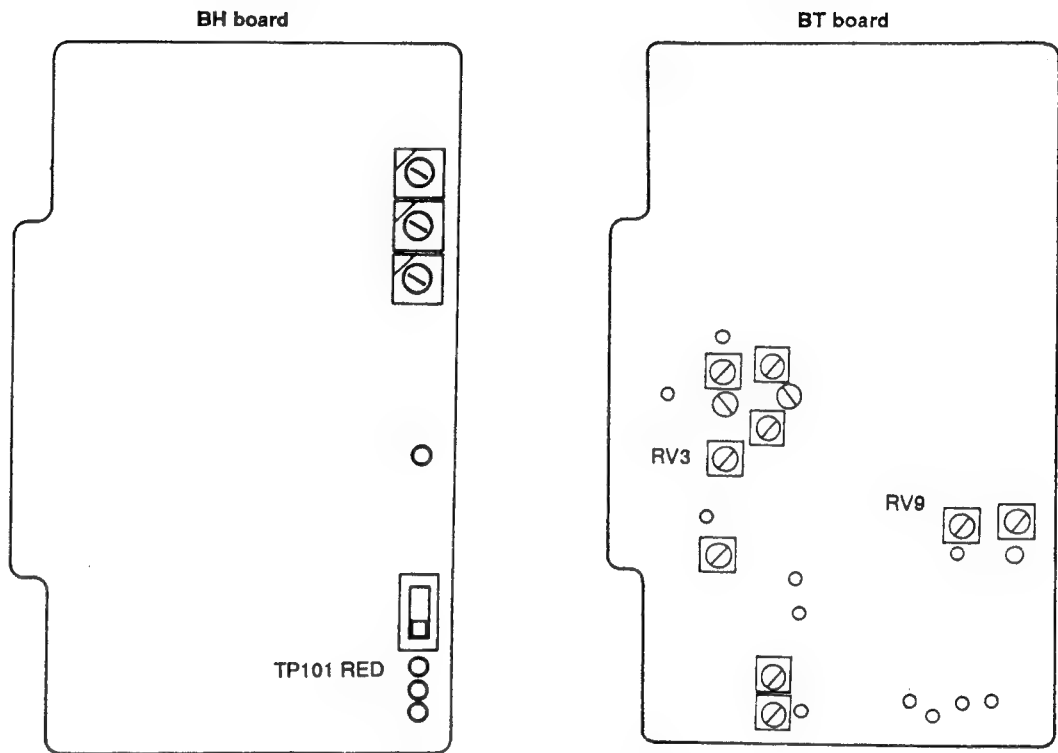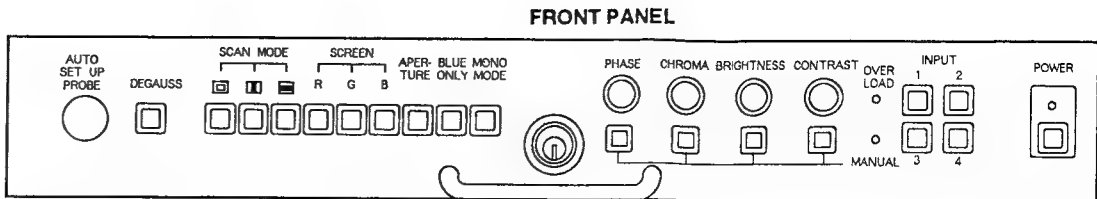
18-2-2. BT Board Y System's Frequency Characteristics Adjustment
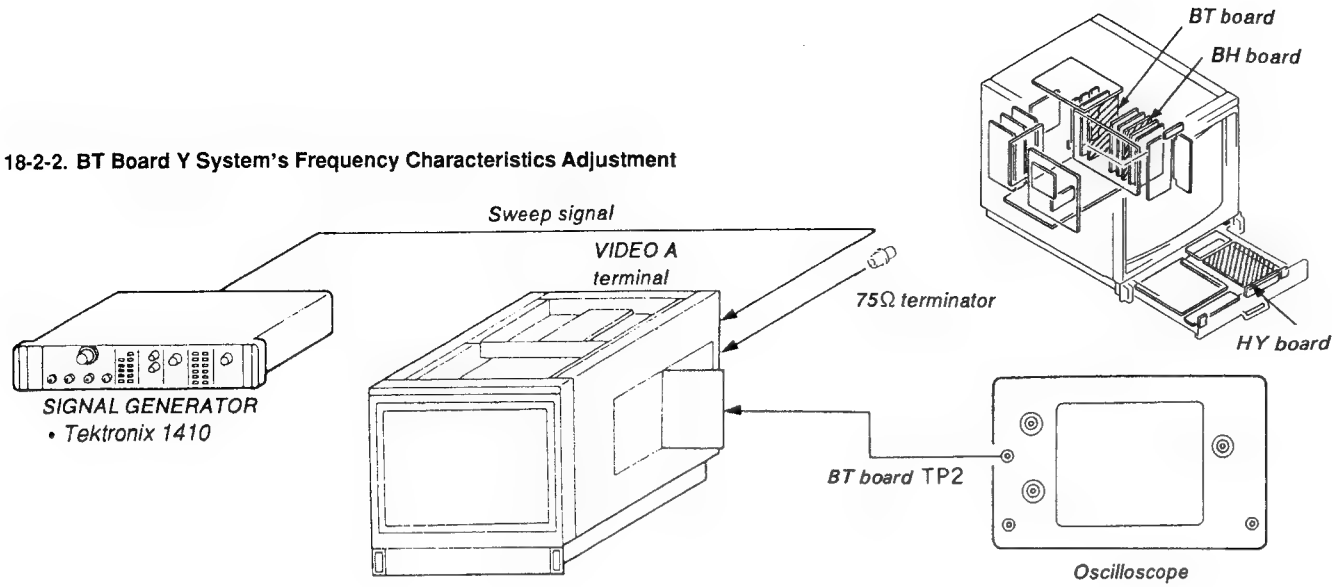
Fig. 18-3   Fig. 18-4

Fig. 18-5

1. Feed a sweep signal to the VIDEO A INPUT terminal of this set.
2. Set the YC SEP switch on the sub control panel to the COMB position.
3. Connect the oscilloscope to TP2 on the BT board. (AC 0.1 V/div:V)
4. Set CV5 to the position as shown in Fig. 18-3.
5. Set the PAL S/SECAM F/COMB S button on the sub control panel to the ON.
6. Adjust the frequency characteristics until it is made flat using CV1 (Y FREQ) on the BT board. If it cannot be properly adjusted by using CV1, use CV5 (Y FREQ).
7. Set the PAL S/SECAM F/COMB S button to the OFF.
8. Adjust the frequency characteristics until it is made flat using CV2 (1H Y FREQ) on the BT board.
9. Set CV3 (CLK PHASE) and CV4 (CLK PHASE) on the BT board to the position as shown in Fig. 18-4.
10. Adjust the clock phase until it becomes just as shown in Fig. 18-5 using CV3.
11. If it cannot be adjusted with CV3, adjust with CV4 by returning CV3 to the position of Fig. 18-4.

FRONT PANEL

BT board

SUB CONTROL PANEL (HY board)
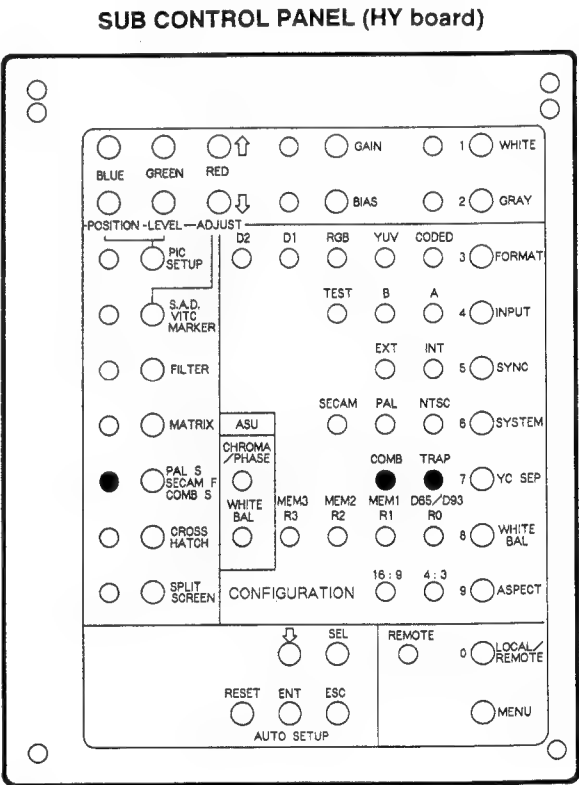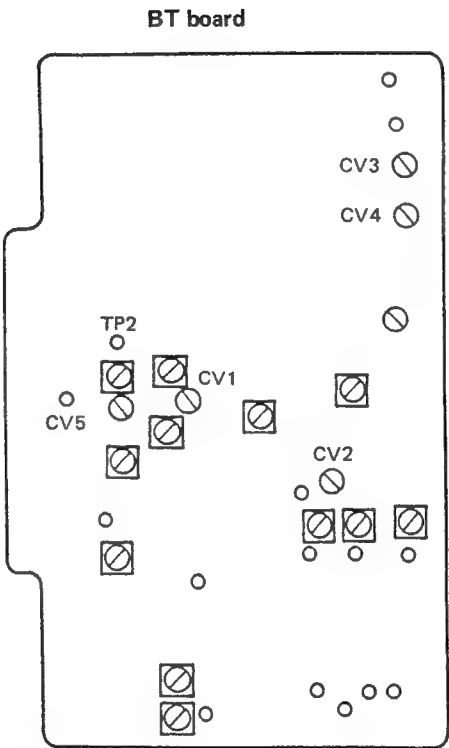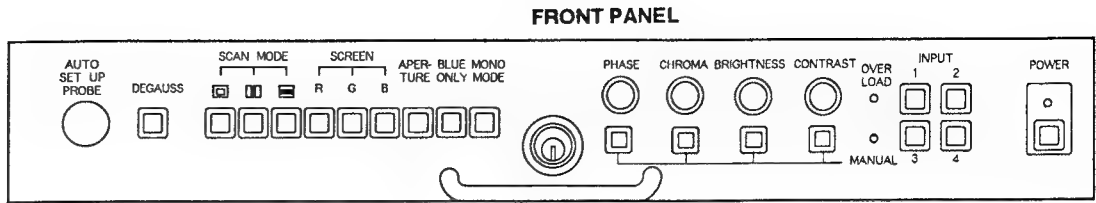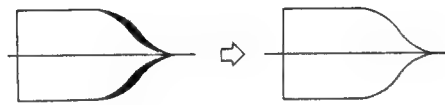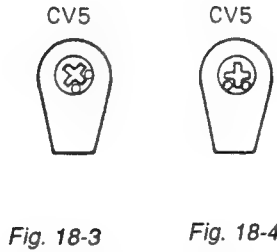
18-2-3. BT Board Band-pass Filter Adjustment
(Adjust only when DLs3, 5, 6 and 8 are replaced.)
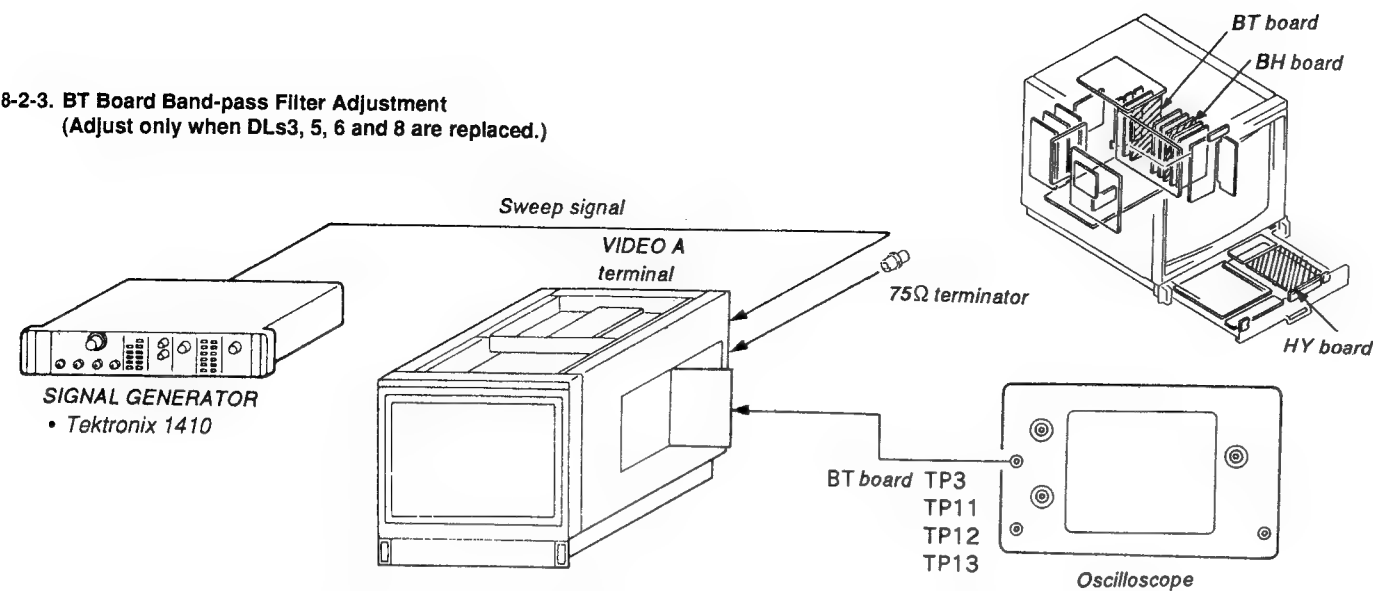
1. Feed a sweep signal to the VIDEO A INPUT terminal of this set.
2. Set the PAL S/SECAM F/COMB S button on the front panel to the ON.
3. Connect the oscilloscope to TP11.
4. Adjust the frequency characteristics using DL3 on the BT board so that the waveform becomes symmetrical as shown in Fig. 18-5 with 3.58 MHz as center frequency.
5. Connect the oscilloscope to TP12.
6. Adjust the frequency characteristics using DL6 on the BT board so that the waveform becomes symmetrical as shown in Fig. 18-5 with 3.58 MHz as center frequency.
7. Connect the oscilloscope to TP13.
8. Adjust the frequency characteristics using DL8 on the BT board so that the waveforms becomes symmetrical as shown in Fig. 18-5 with 3.58 MHz as center frequency.
9. Connect the oscilloscope to TP3.
10. Adjust the frequency characteristics using DL5 on the BT board so that the waveforms becomes symmetrical as shown in Fig. 18-5 with 3.58 MHz as center frequency.

BT board TP3
TP11
TP12
TP13

Oscilloscope

A | B   A = B
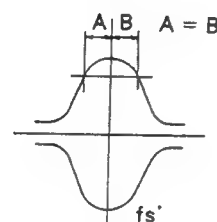
Fig. 18-6

18-2-4. BT Board Clock fo Adjustment
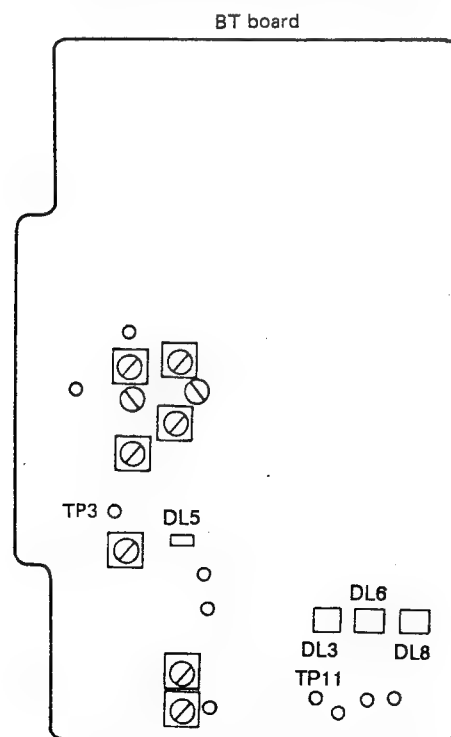
BT board TP14   Frequency counter
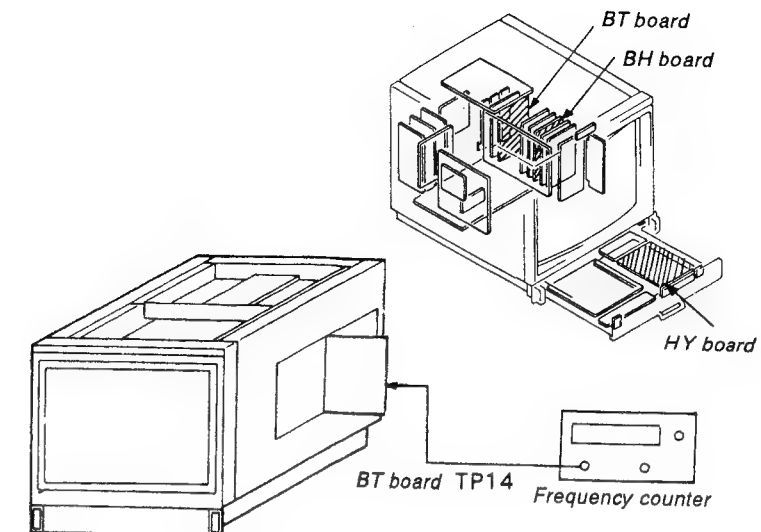
1. Connect the frequency counter to TP14.
2. Make adjustment as shown below using CV6 (CLK FREQ) on the BT board.
   • fo=21.477 MHz

BT board

TP14

SUB CONTROL PANEL (HY board)

BT board

TP3   DL5
DL6
DL3   DL8
TP11
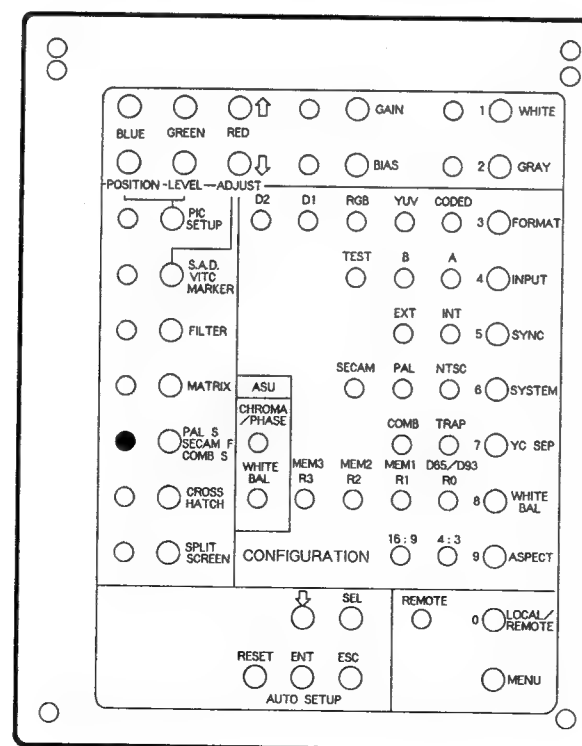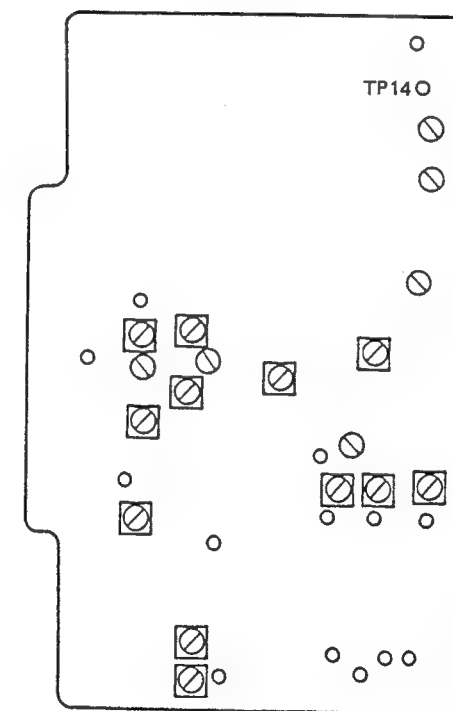
18-2-5. BT Board 0H/1H, 1H/2H MIX Adjustment
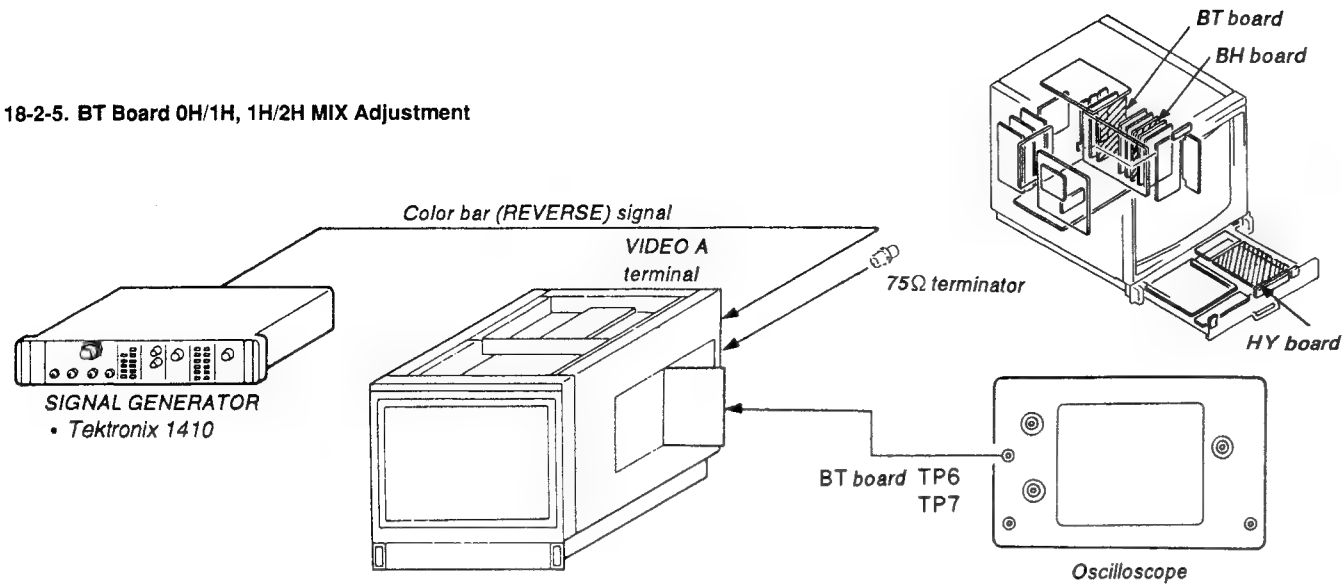
1. Feed a color bar signal (REVERSE) to the VIDEO A INPUT terminal of this set.
2. Connect the oscilloscope to TP6 to magnify the signal inverted area.
3. Turn RV5 (0H/1H MIX LEVEL) and RV10 (0H/1H MIX PHASE) on the BT board until the portion shown in Fig. 18-7 is reduced to a minimum.
4. Connect the oscilloscope to TP7.
5. Turn RV12 (1H/2H MIX PHASE) and RV11 (1H/2H MIX LEVEL) on the BT board until the portion shown in Fig. 18-7 is reduced to a minimum.

Enlarged view of inverted signal section
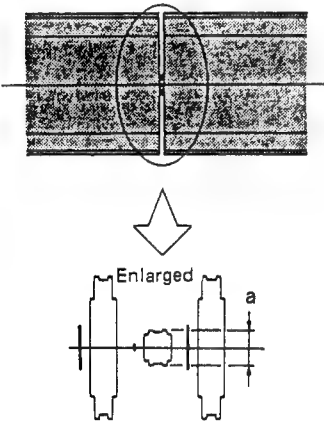
Fig. 18-7

BT board

4-57

18-2-6. BT Board Y/C MIX Adjustment
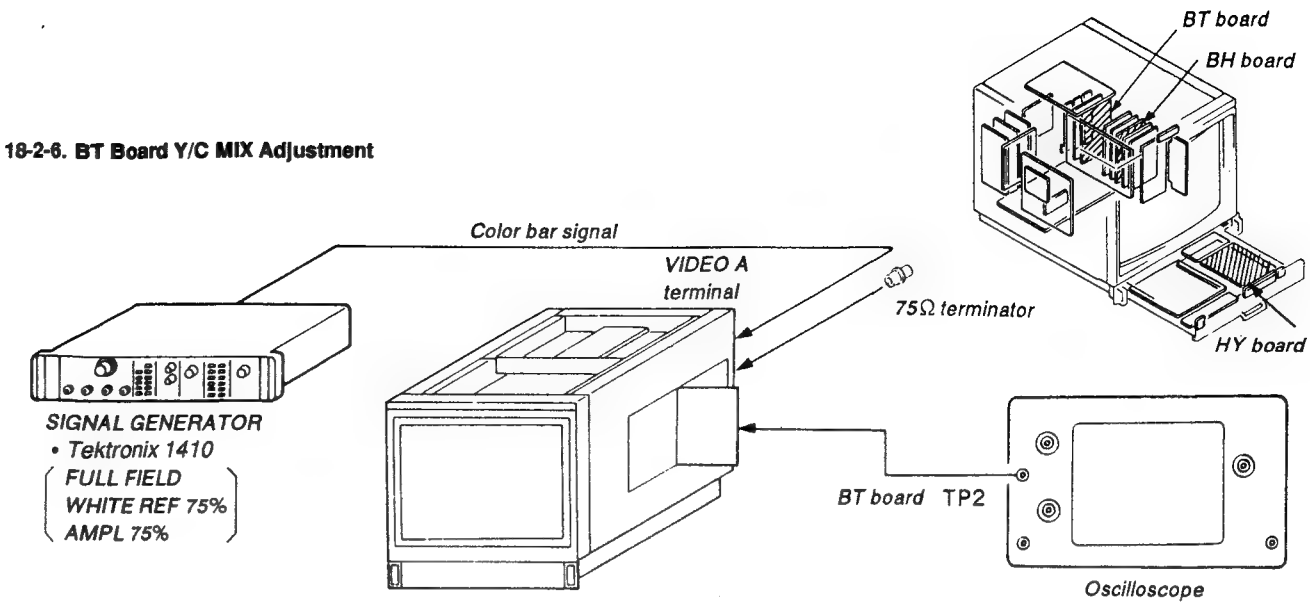
1. Feed a color bar signal to the VIDEO A INPUT terminal of this set.
2. Connect the oscilloscope to TP2 on the BT board.
3. Set the PAL S/SECAM F/COMB S button on the sub control panel to the OFF.
4. Turn RV1 (Y/C MIX PHASE) and RV2 (Y/C MIX LEVEL) on the BT board so that the sub-carrier level is reduced to a minimum as shown in Fig. 18-8.

Fig. 18-8
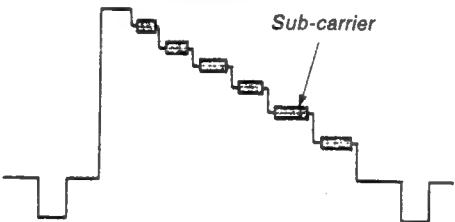
SUB CONTROL PANEL (HY board)

18-2-7. S COMB Adjustment

1. Feed a color bar signal to the VIDEO A INPUT terminal of this set.
2. Set the PAL S/SECAM F/COMB S button on the sub control panel to the ON.
3. Connect the oscilloscope to TP2 on the BT board.
4. Turn RV6 (S COMB C Level) and RV7 (S COMB C PHASE) on the BT board so that the sub-carrier level is reduced to a minimum as shown in Fig. 18-8.

BT board

4-58
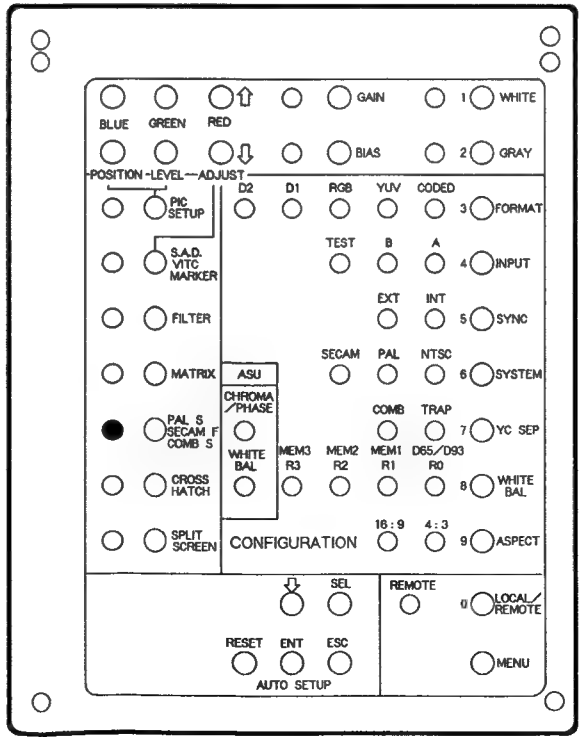
18-2-8. BT Board Chroma Level Adjustment
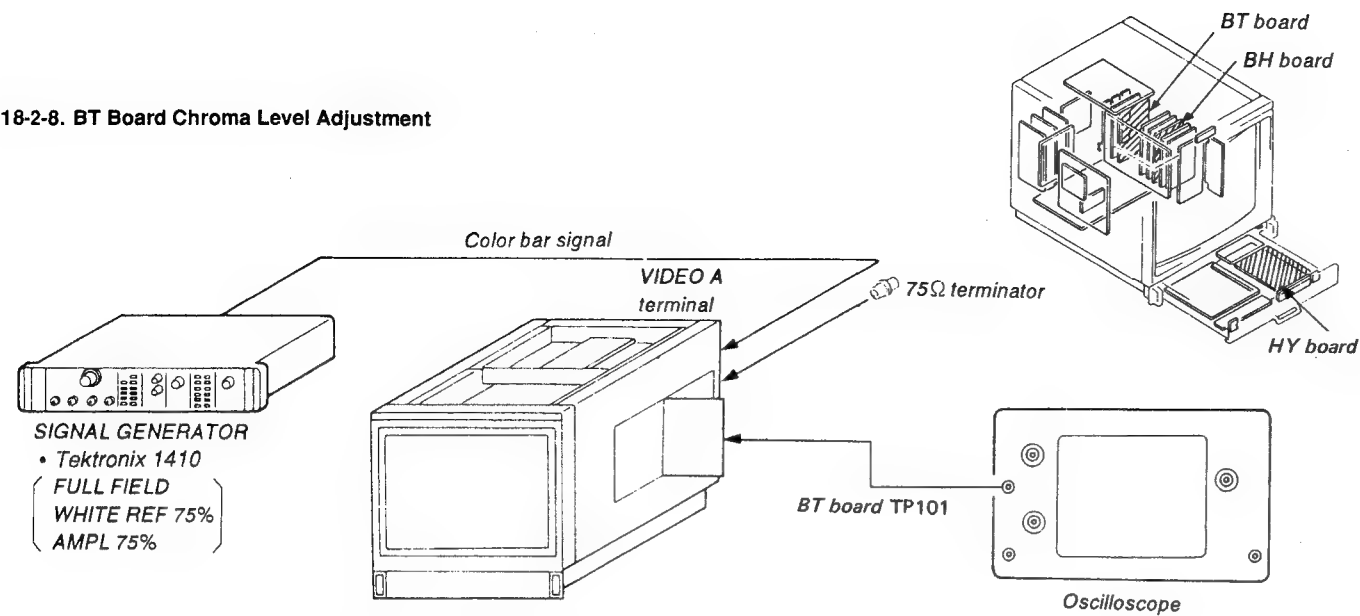
1. Feed a color bar signal to the VIDEO A INPUT terminal of this set.
2. Set the YC SEP switch on the sub control panel to the TRAP position.
3. Connect the oscilloscope to TP101 on the BT board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope to set the portion B (red) of Fig. 18-9 to the center of the oscilloscope.
5. Set the YC SEP button to the COMB position.
6. Set the PAL S/SECAM F/COMB S button on the sub control panel to the ON.
7. Set the portion B (red) of Fig. 18-9 to the center of the oscilloscope using RV8 (C OUTPUT LEVEL) on the BT board.
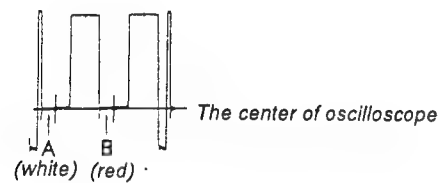
Fig. 18-9
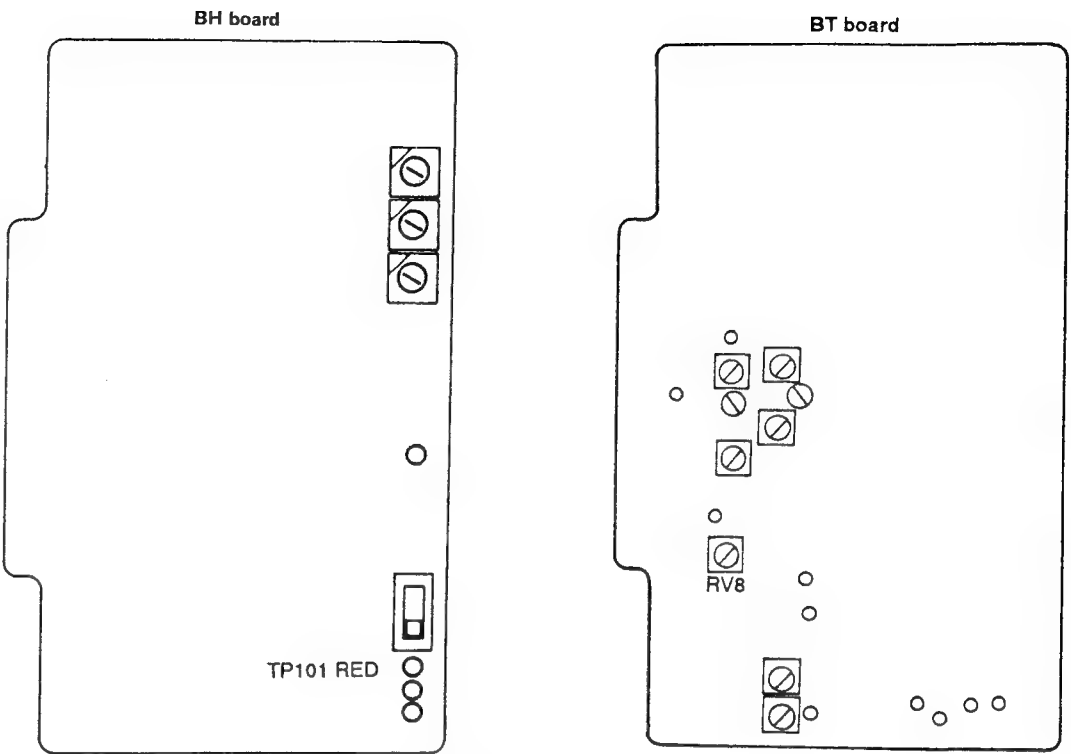
SUB CONTROL PANEL (HY board)
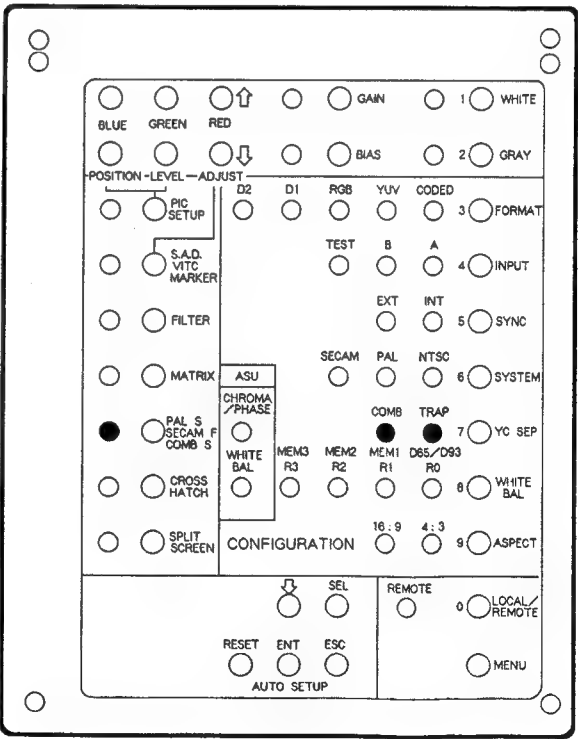
18-2-9. BT Board Y/C DELAY Adjustment

Fig. 18-10
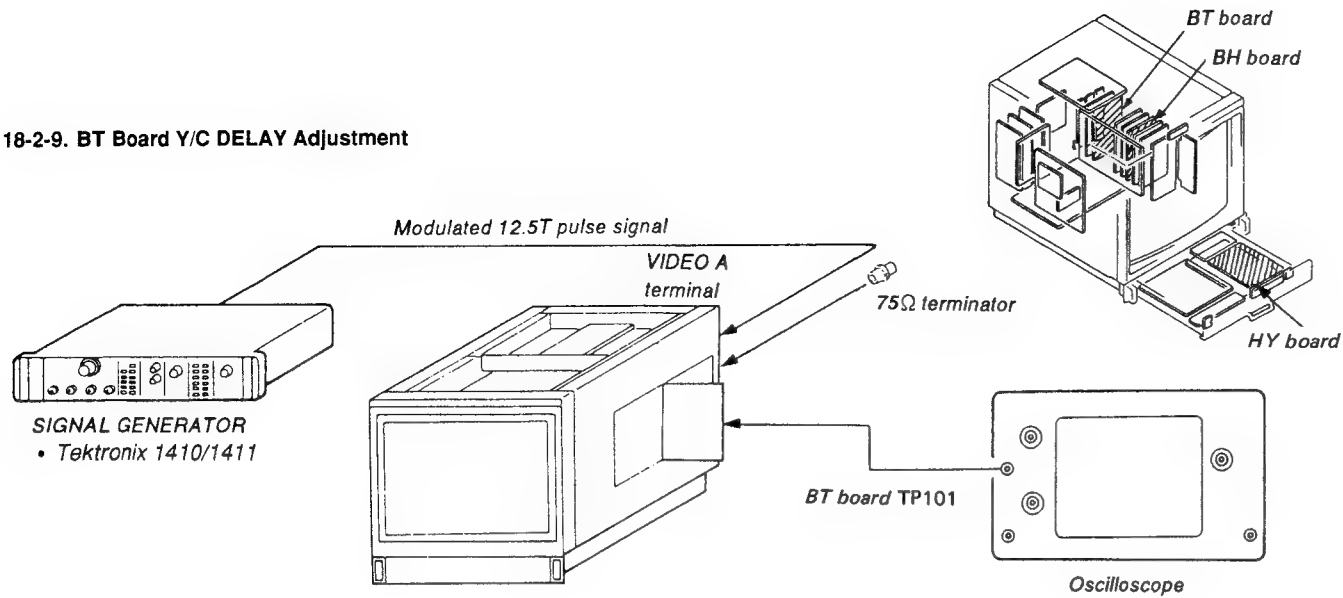
1. Feed a 12.5T pulse signal to the VIDEO A terminal of this set.
2. Set the PAL S/SECAM F/COMB S button to the ON.
3. Connect the oscilloscope to TP101 on the BH board.
4. Turn the CHROMA MANUAL control (on the front panel) until the chroma signal is adjusted as shown in Fig. 18-10.
5. After adjustment, turn RV4 (Y/C DELAY) on the BT board until the waveform is symmetrical.

FRONT PANEL

BH board

BT board
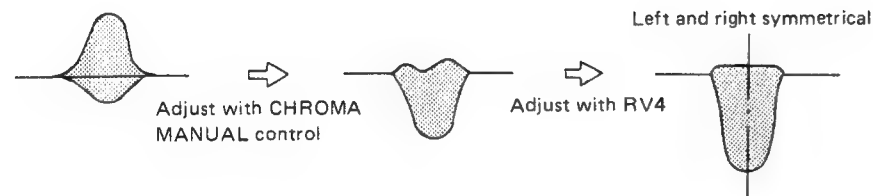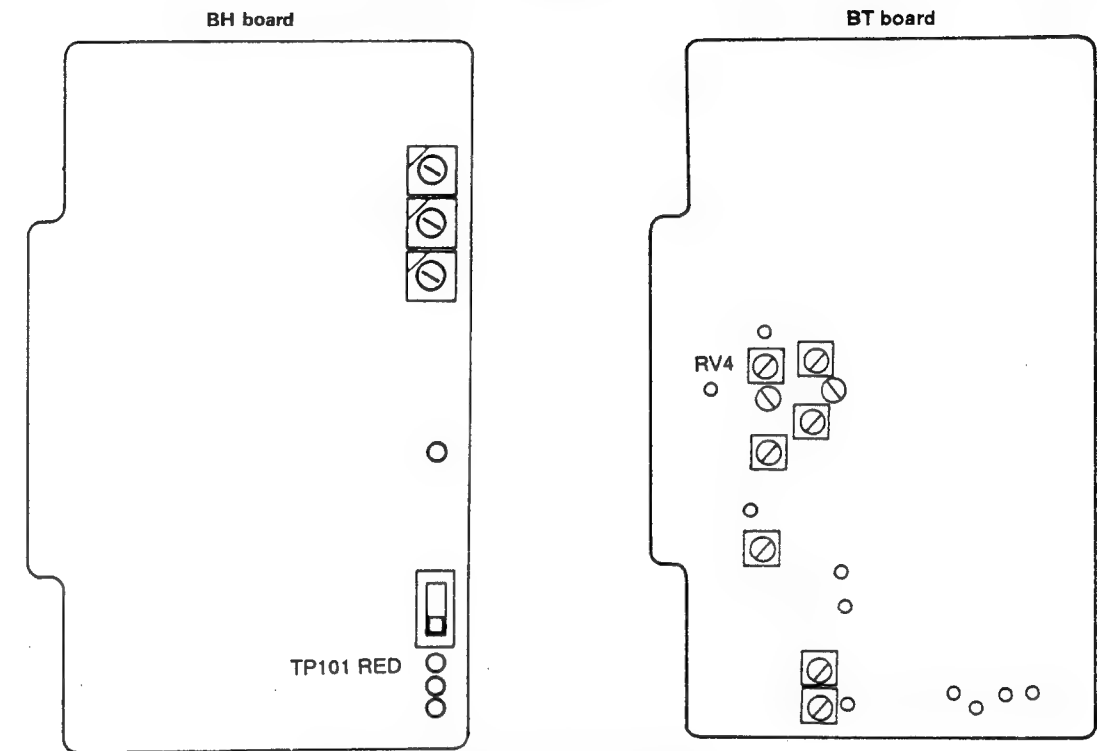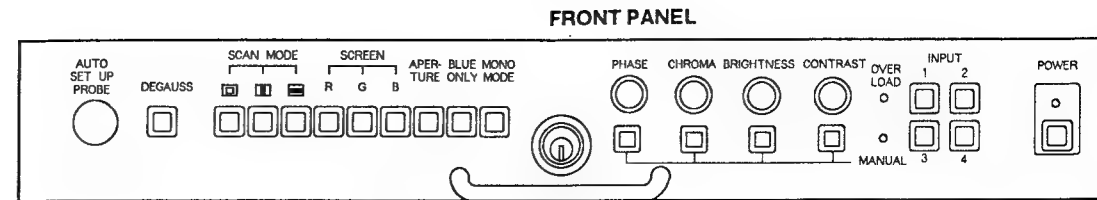
SUB CONTROL PANEL (HY board)
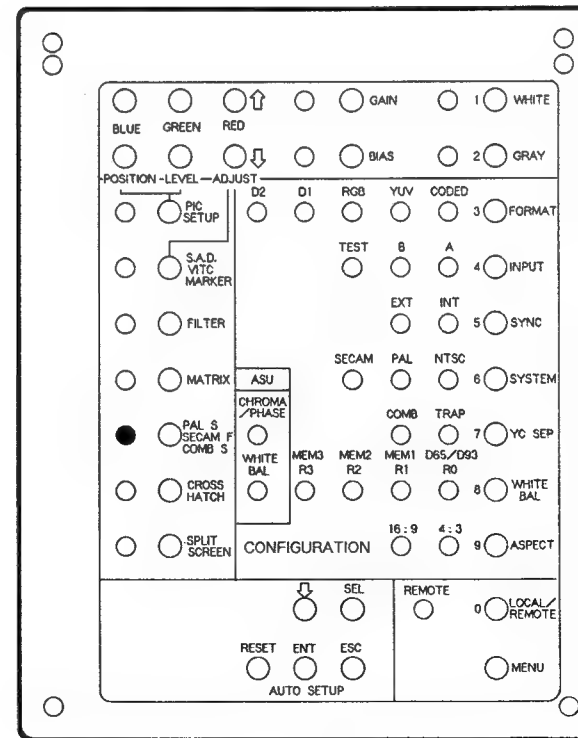
19. BD (PAL) BOARD BPF ADJUSTMENT (BVM-2011P ONLY)

Sweep signal (10MHz)

VIDEO A terminal

75Ω terminator

Tektronix 1411 (PAL) Generator

BG board TP 2

Oscilloscope

BD board
BG board
HY board
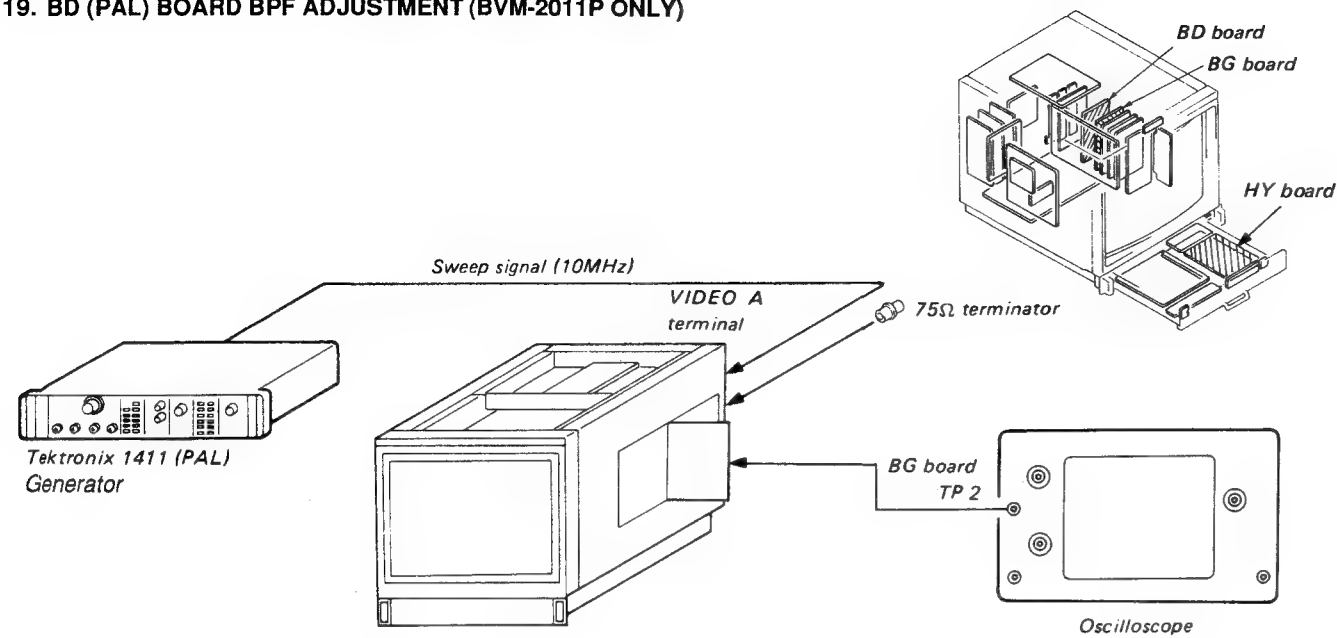
- PAL S/SECAM F/COMB S button
  (SUB CONTROL PANEL)·················· ON
1. Input SWEEP signal (10MHz) to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 on the BG board.
3. Make the V/div of oscilloscope into VARIABLE, and match the upper section of waveform to 7 div as shown in Fig. 19-1.

7 div.

Fig. 19-1
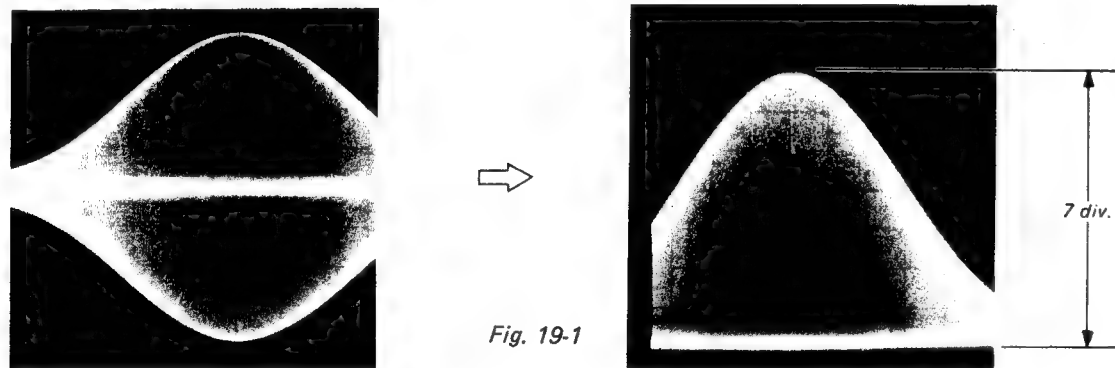
4. Adjust L3 on the BD board so that A is equal to B as shown in Fig. 8-2.

A < B

A = B

5 div

A is equal to B when the amplitude is 5 div.

Fig. 19-2

BD board

L3

BG board

TP2 R-Y
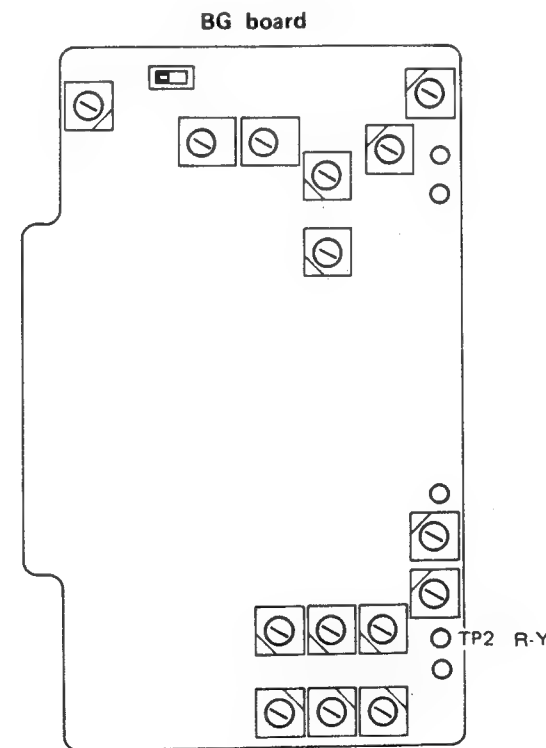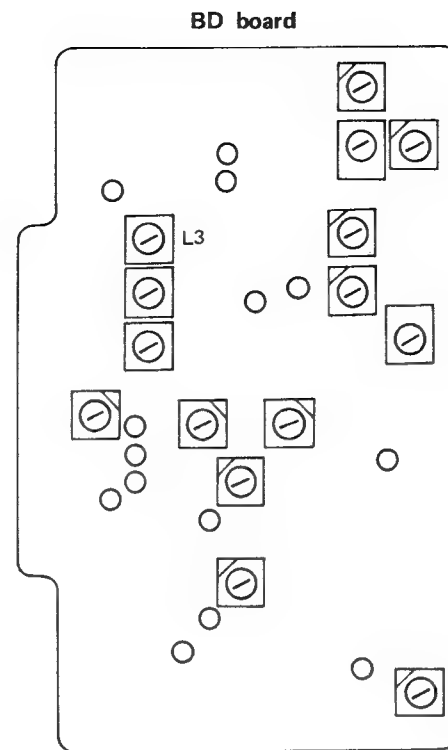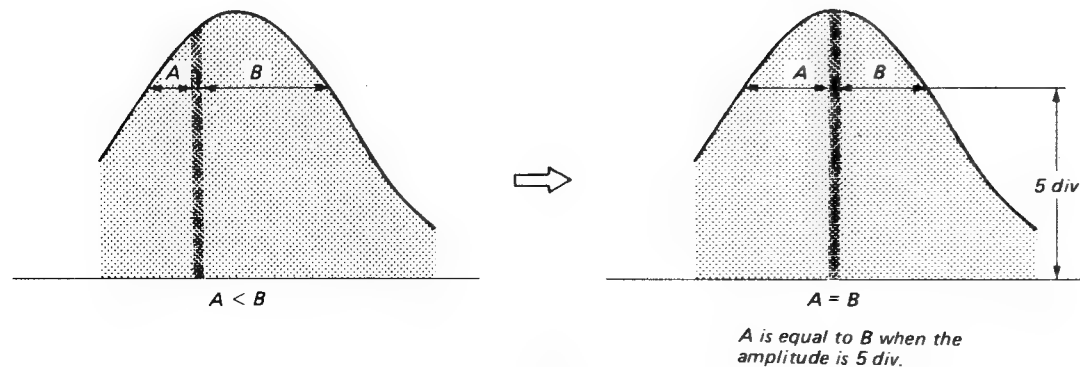
SUB CONTROL PANEL (HY board)
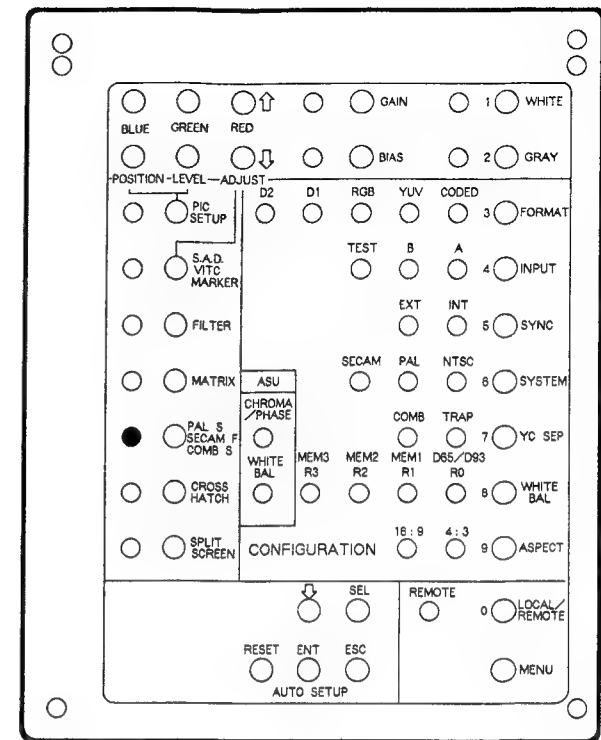
20. BD (PAL) BOARD PHASE SHIFT ADJUSTMENT (BVM-2011P ONLY)

Fig. 20-1

- SYNC button (SUB CONTROL PANEL)············· EXT
- PAL S/SECAM F/COMB S button
  (SUB CONTROL PANEL)····························· ON
- RV2 (BD BOARD) ·······················MECHANICAL CENTER
- CV1 (BD BOARD)·······················MECHANICAL CENTER
- CV2 (BD BOARD)·······················MECHANICAL CENTER

1. Complete the connection as shown in Fig. 20-1.
2. Connect an socilloscope to the TP2 on the BG board.
3. Make the waeform flat with the PHASE control of front panel (R) as shown in Fig. 20-2.

4. Attenuate the signal by 10dB by using attenuator.
5. Adjust RV2 on the BD board so that the output waveform becomes flat as shown in Fig. 20-2.
6. Restore the attenuator to 0dB.
7. Repeat the steps 3 to 5.

Fig. 20-2

FRONT PANEL

BD board

BG board

SUB CONTROL PANEL (HY board)
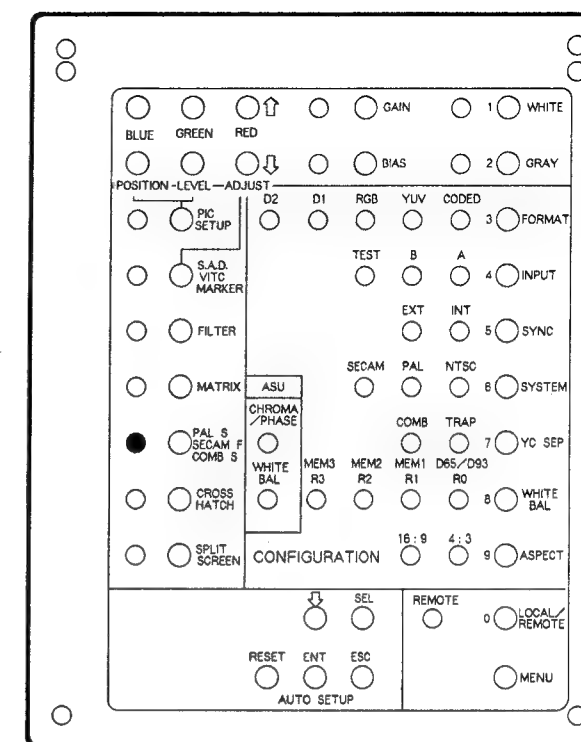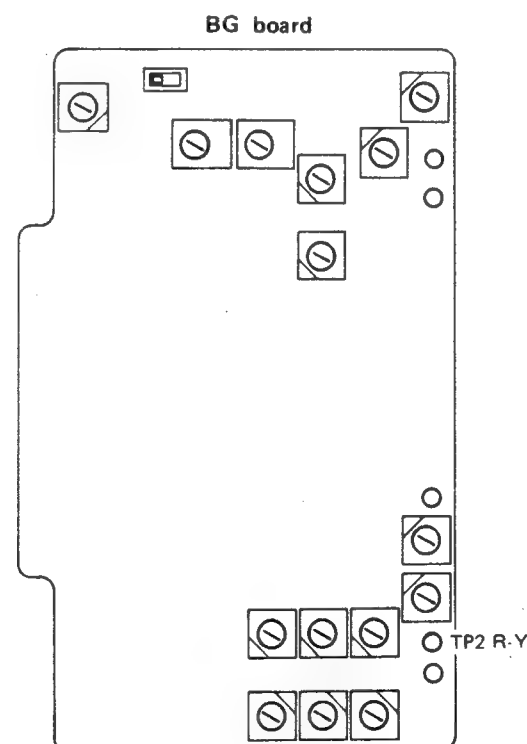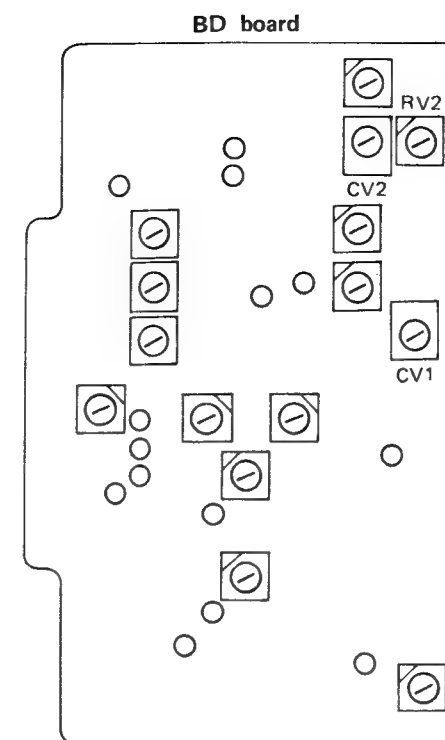
21. BD BOARD 4.43 MHz (PAL) fo ADJUSTMENT (BVM-2011P ONLY)

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 of BD board.
3. Short-circuit between TP11, 12 of BD board with a jumper wire.
4. Adjust CV2 of BD board so that the output waveform is shifted slowly as shown in Fig. 21-1.
5. Turn off the power of this monitor, and disconnect TP11, 12 of BD board.
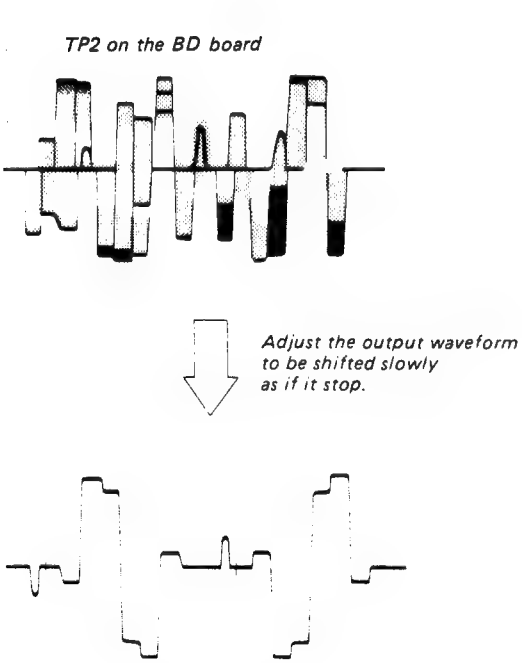
Fig. 21-1
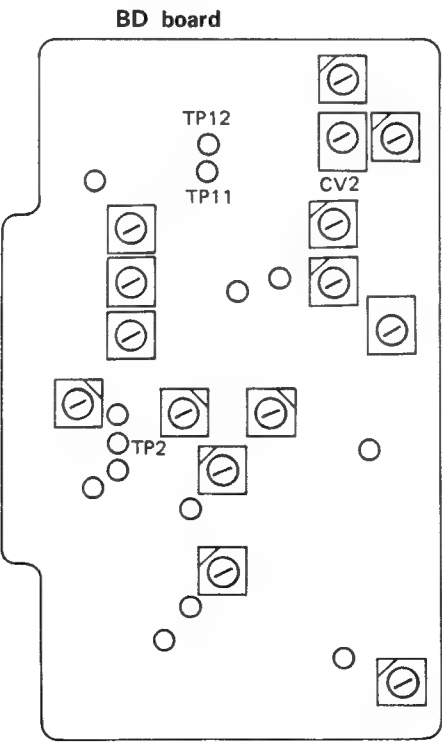
BD board

22. BD BOARD (PAL) COLOR DIFFERNCE PHASE ADJUSTMENT (BVM-2011P ONLY)
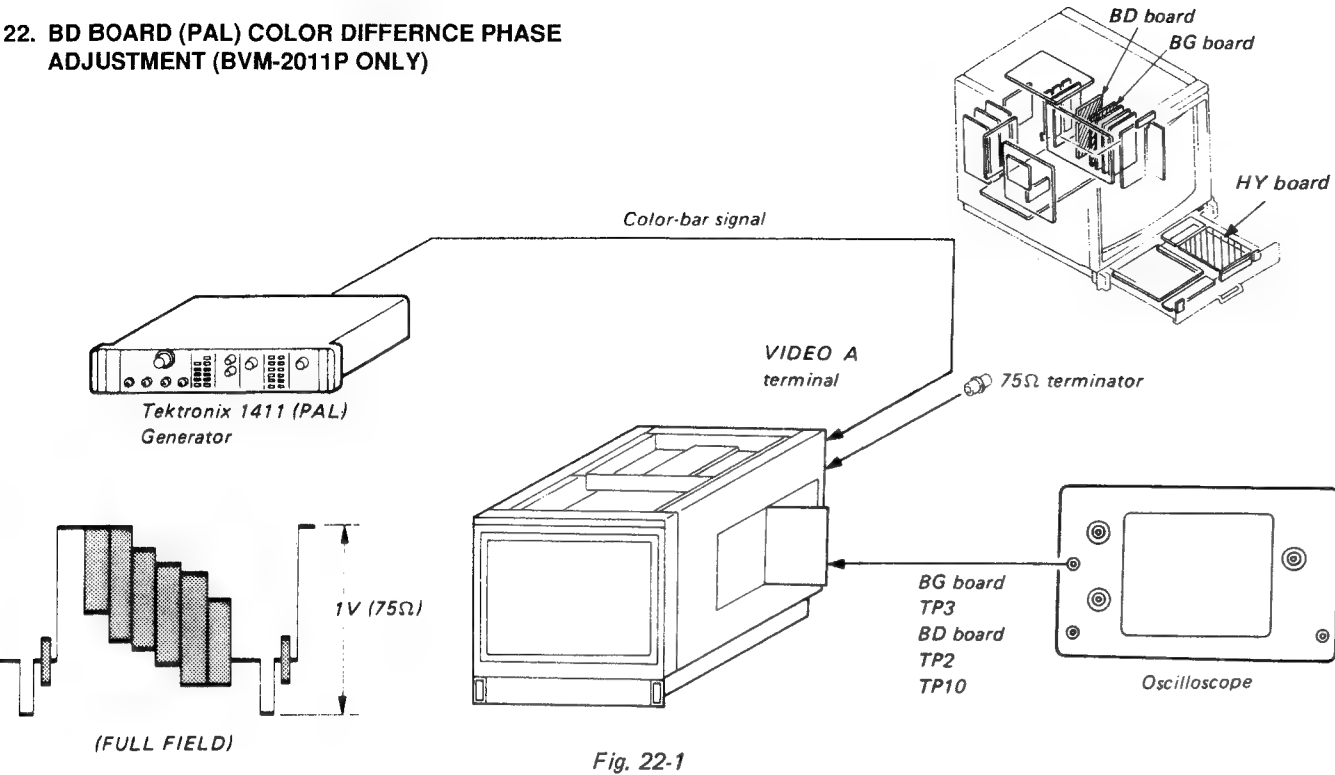
Fig. 22-1

1. Complete the connections as shown in Fig. 22-1.
2. Turn on the power of this monitor. Set the INPUT switch to the 1 position, the SYNC switch to the INT position, and the PAL S/SECAM F/COMB S button to the ON.

B-Y System Adjustment

3. Connect the oscilloscope probe to TP3 on the BG board, and turn off the U (B-Y) signal of the signal generator.
4. Set the oscilloscope sensitivity to 20mV/DIV, and adjust RV8 on the BD board so that the output waveform is flat. (See Fig. 22-2.)

Fig. 22-2

SUB CONTROL PANEL (HY board)

Quad Adjustment

5. Connect the oscilloscope probe to TP on the BD board. Turn on the U signal of the signal generator, and turn off the V (R-Y) signal. Then adjust CV1 on the BD board so that the output waveform is flat. (See Fig. 22-3.)
6. Repeat the steps 3 to 6.

Fig. 22-3

PAL·D Phase Adjustment

7. Set the PAL S/SECAM F/COMB·S button to the OFF and turn on the V signal of the signal generator, and turn off U signal.
8. Connect the oscilloscope probe to TP10 on the BD board.
9. Adjust RV7 on the BD board so that the output waveform is flat. (See Fig. 22-2.)
10. Finally, perform the adjustments of 3 and 4 by directly mounting the BD board to the set, without using the extension board.

BD board

BG Board

23. BD BOARD (PAL) COLOR DIFFERNCE LEVEL ADJUSTMENT (BVM-2011P ONLY)

BD board
BG board
BH board

HY board

Color-bar signal

VIDEO A terminal

75Ω terminator

Tektronix 1411 (PAL) Generator

*Color-bar signal

FULL FIELD color-bar
100 IRE
75% AMPL

BH board
TP101
TP201
TP301

Oscilloscope

• PAL S/SECAM F/COMB S button
  (SUB CONTROL PANEL)·····················ON

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP101 of BH board.
3. Adjust RV3 of BD or BM board so that the levels with ※ is flat as shown in Fig. 23-1.
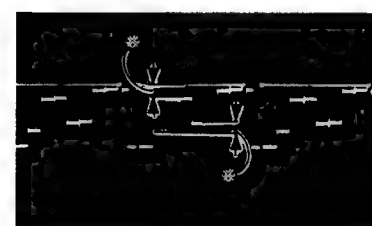
TP101 R OUT

* Adjust the levels with ※ to be flat respectively useing RV3 of BD board

Fig. 23-1

4. Connect an oscilloscope to the TP301 of BH board.
5. Adjust RV4 of BD board so that the output waveform as shown in Fig. 23-2.
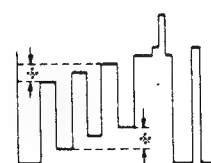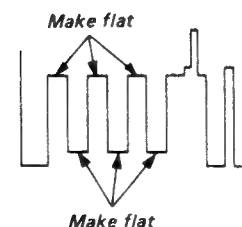
Make flat

Make flat

TP301 B OUT

Fig. 23-2

SUB CONTROL PANEL (HY board)

| BLUE | GREEN | RED | | GAIN | | 1 | WHITE |
| | | | | BIAS | | 2 | GRAY |

POSITION —LEVEL—ADJUST

	PIC SETUP	D2	D1	RGB	YUV	CODED	3	FORMAT
	S.A.D. VITC MARKER		TEST	B	A		4	INPUT
	FILTER			EXT	INT		5	SYNC
	MATRIX	ASU	SECAM	PAL	NTSC		6	SYSTEM
●	PAL S SECAM F COMB S	CHROMA PHASE		COMB	TRAP		7	YC SEP
	CROSS HATCH	WHITE BAL	MEM3 R3	MEM2 R2	MEM1 R1	D65/D93 R0	8	WHITE BAL
	SPLIT SCREEN	CONFIGURATION		16:9	4:3		9	ASPECT

SEL   REMOTE
0 LOCAL/REMOTE

RESET ENT ESC
AUTO SETUP

MENU

---

6. Connect an oscilloscope to the TP201 of BH board.
7. Adjust RV4 and RV5 of BG board so that the INPUT waveform becomes flat as shown in Fig. 23-3.

TP201 G OUT

RV4

RV5

Fig. 23-3

BG board

RV5
RV4

BD board

RV3

RV4

BH Board

TP101 R OUT
TP201 G OUT
TP301 B OUT
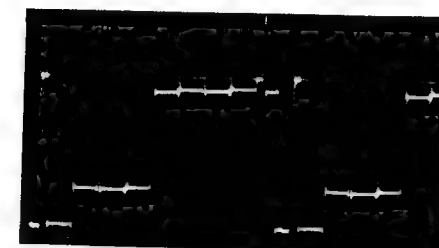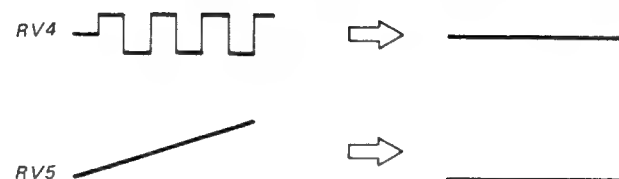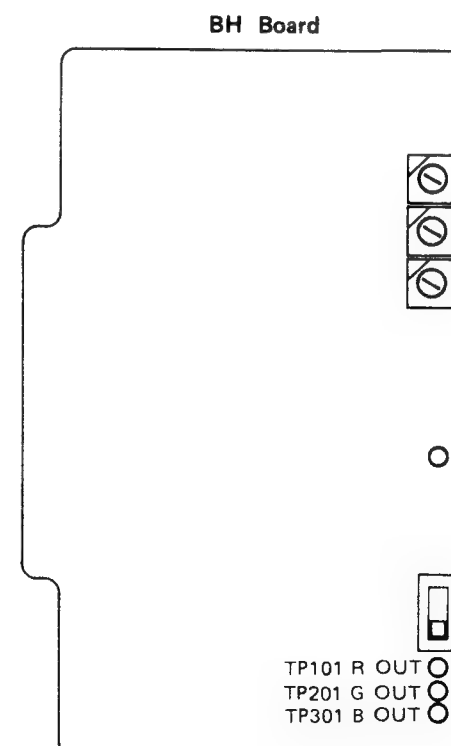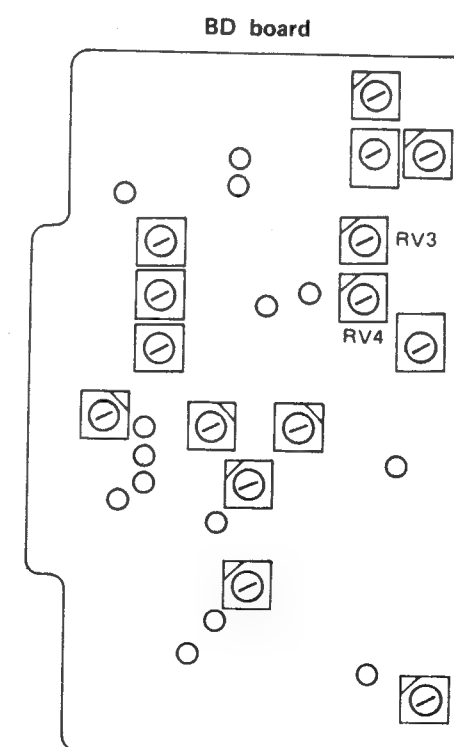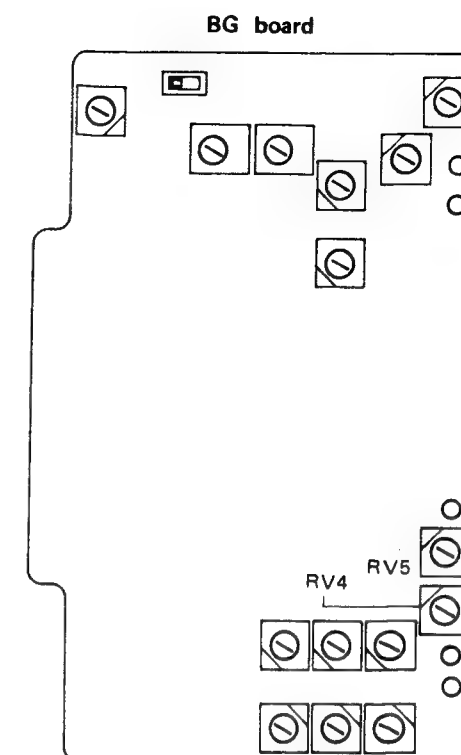
24. BD BOARD (PAL) PAL-D GAIN AND CCD BIAS ADJUSTMANT (BVM-2011P ONLY)

BD board
BG board
HY board

2T PULSE signal

VIDEO A terminal

75Ω terminator

Tektronix 1411 (PAL) Generator

1V (75Ω)

(REVERSE MODE)

BG board TP2, 3

Oscilloscope

Fig. 24-1

BD board

RV10   RV9

RV5

RV6
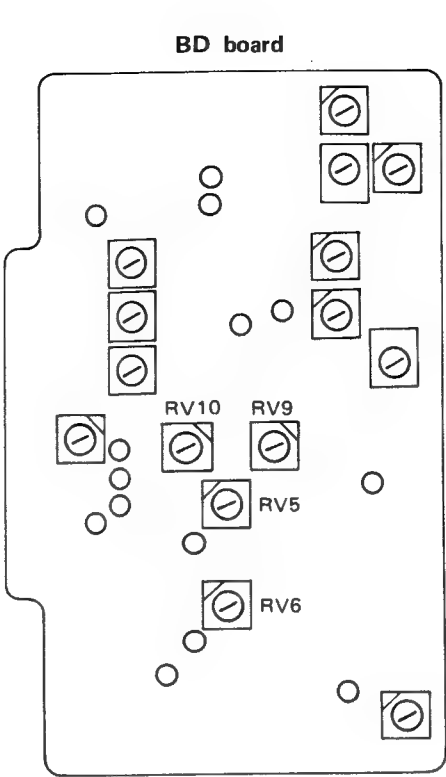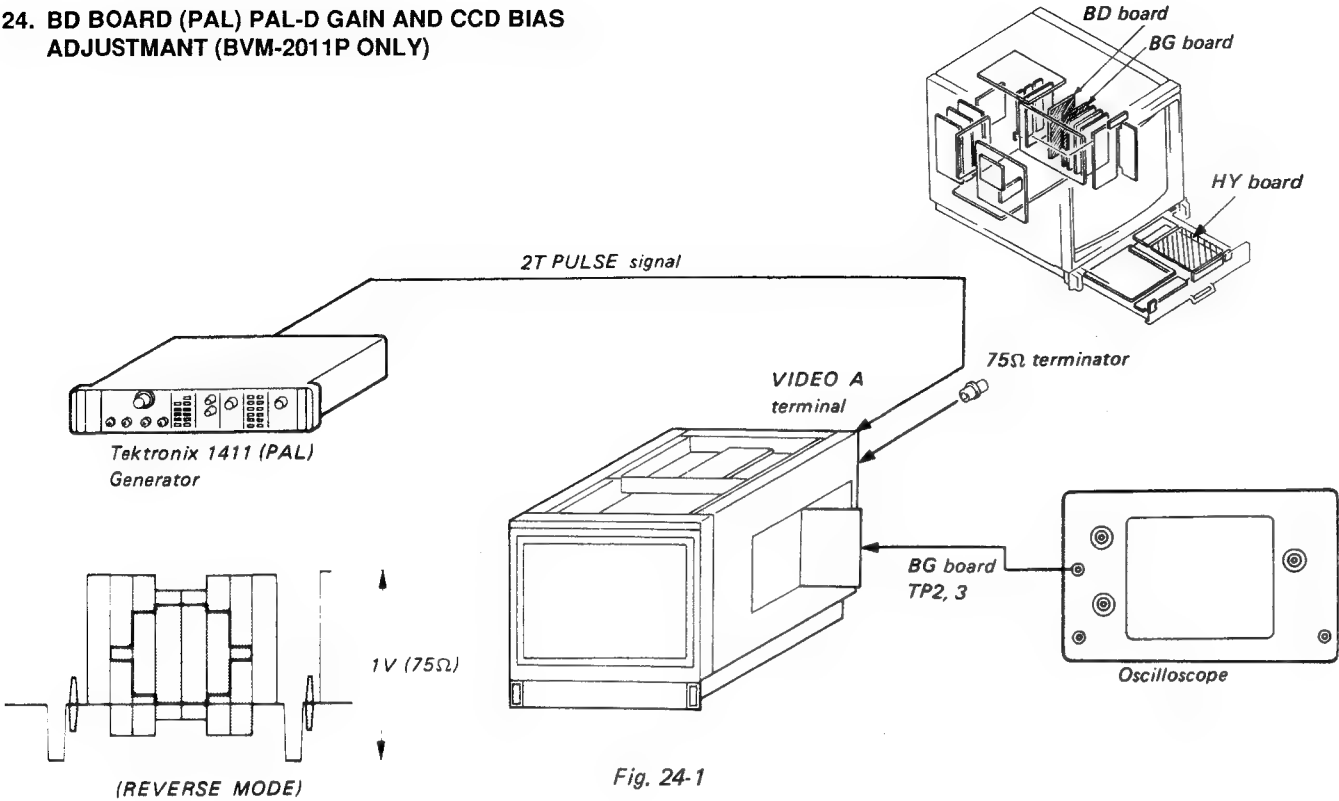
• PAL S/SECAM F/COMB S button
  (SUB CONTPOL PANEL) .... OFF

1. Complete the connection as shown in Fig. 24-1.
   Turn on the power of this monitor. Set the INPUT switch to the 1 position, and the SYNC switch to the INT position.
2. Connect the oscilloscope probe to TP2 on the BG board.
3. Turn RV5 and RV6 on the BD board fully clockwise.
4. By observing the waveform shown in Fig. 24-2, adjust RV9 on the BD board so that it becomes A=B.
5. Adjust RV5 on the BD board so that the waveform shown in Fig. 24-2 becomes flat.
6. Connect the probe of the oscilloscope to TP3 on the BG board and observe the section shwon in Fig. 24-3.
7. Adjust RV10 on the BD board so that the waveform of the oscilloscope becomes A=B.
8. Adjust RV6 on the BD board so that the waveform shown in Fig. 24-3 becomes flat.

TP2 on the BG board

V cycle

(R-Y waveform)

Delayed B mode

Adjust RV5 to be flat.

Fig. 24-2

TP3 on the BG board

V cycle

(B-Y waveform)

Delayed B mode

Adjust RV6 to be flat.

Fig. 24-3

BG board

TP2 R-Y
TP3 B-Y
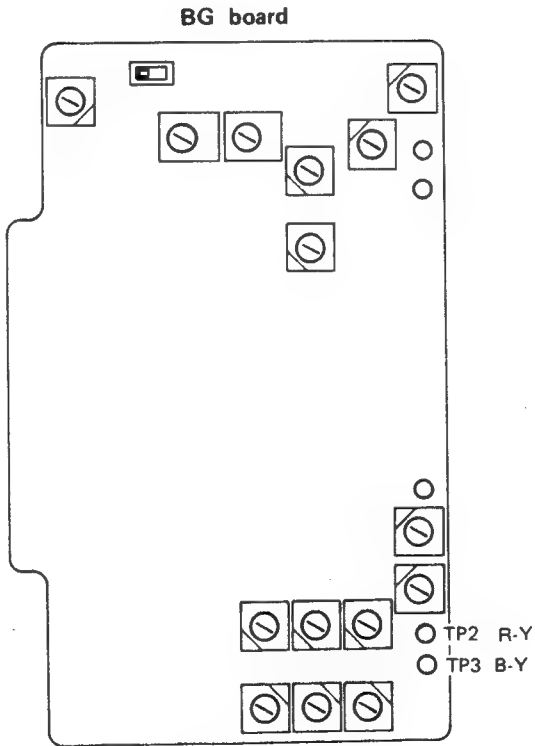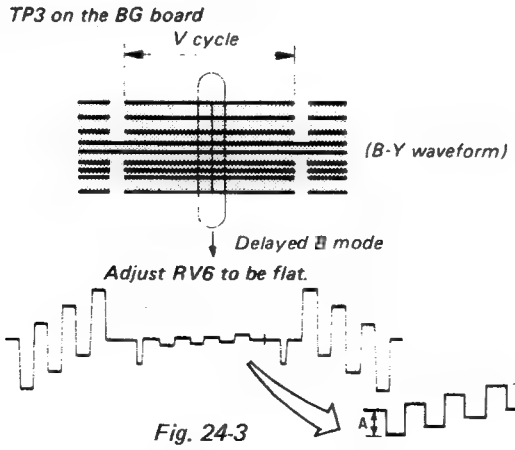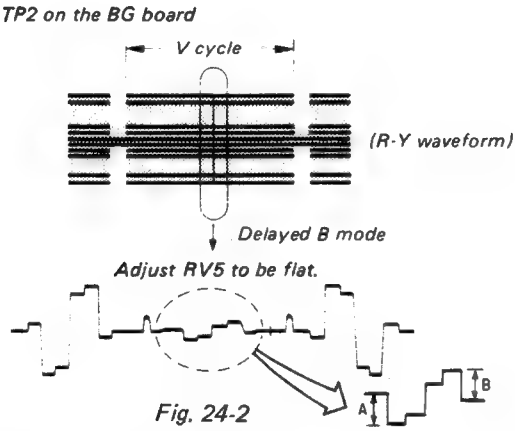
25. BD BOARD (PAL) Y TRAP ADJUSTMENT
(BVM-2011P ONLY)
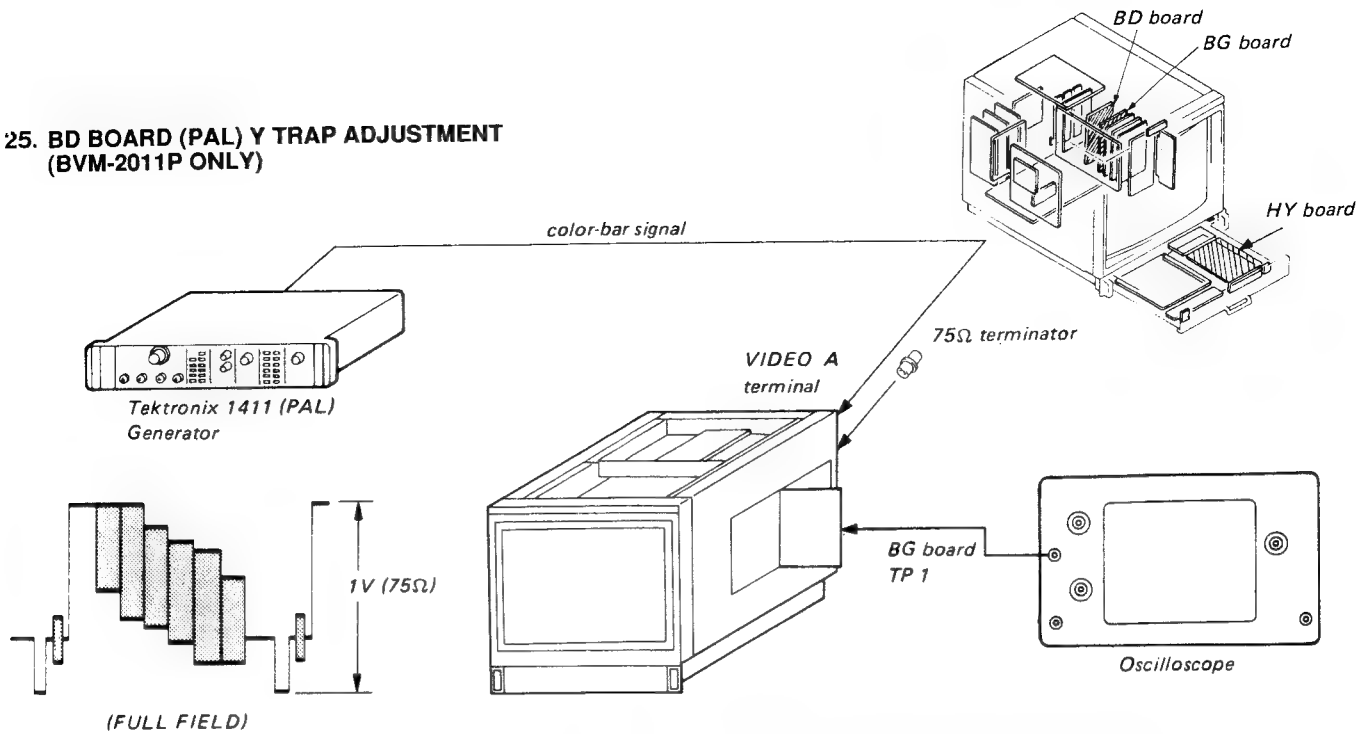
color-bar signal

BD board
BG board
HY board

Tektronix 1411 (PAL)
Generator

VIDEO A
terminal

75Ω terminator

1V (75Ω)

(FULL FIELD)

BG board
TP 1

Oscilloscope

1. Input color-bar signal to VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L1 of BD board so that 4.43 MHz (PAL) subcarrier is minimum as shown in Fig. 25-1.

Fig. 25-1

BG board

TP1 Y
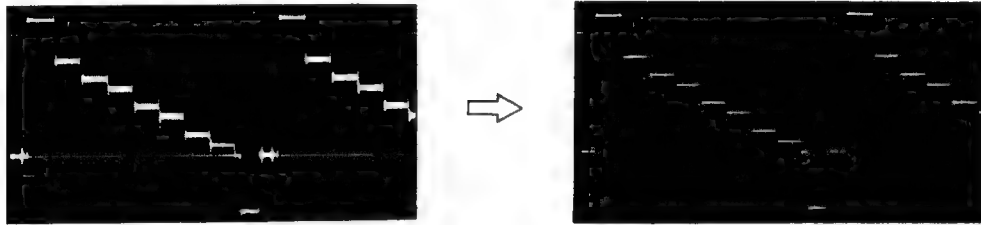
BD board

L1
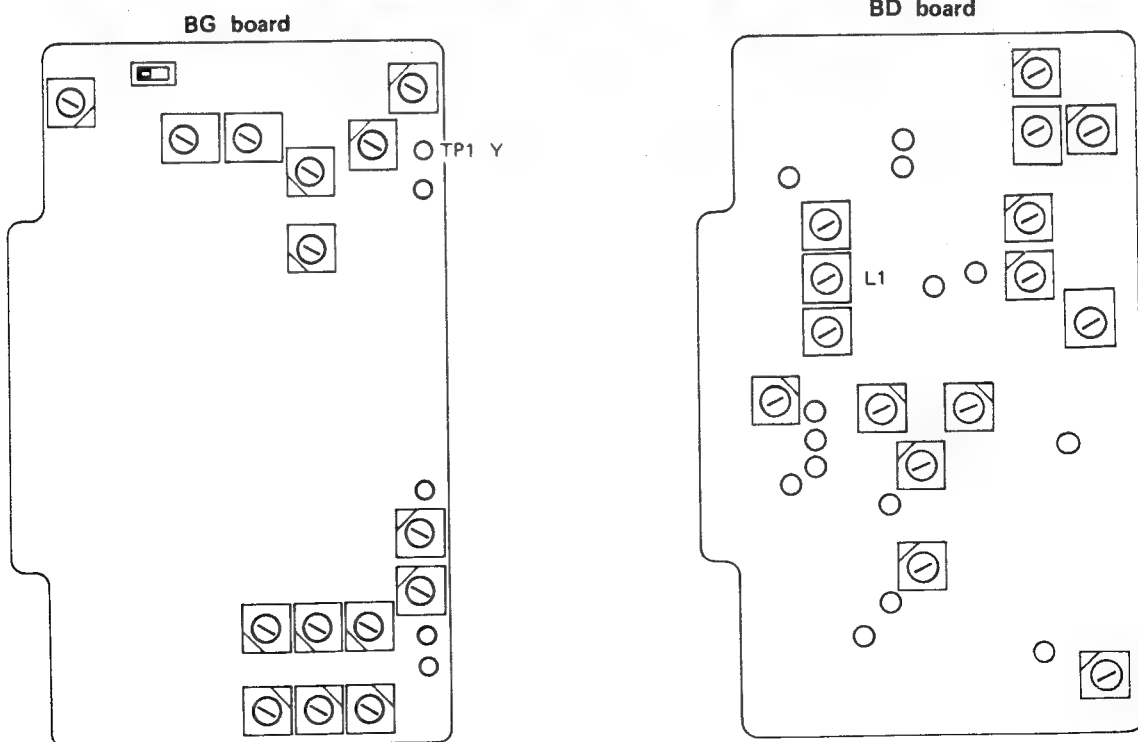
26. BD BOARD (PAL) DELAY TIME ADJUSTMENT
(BVM-2011P ONLY)
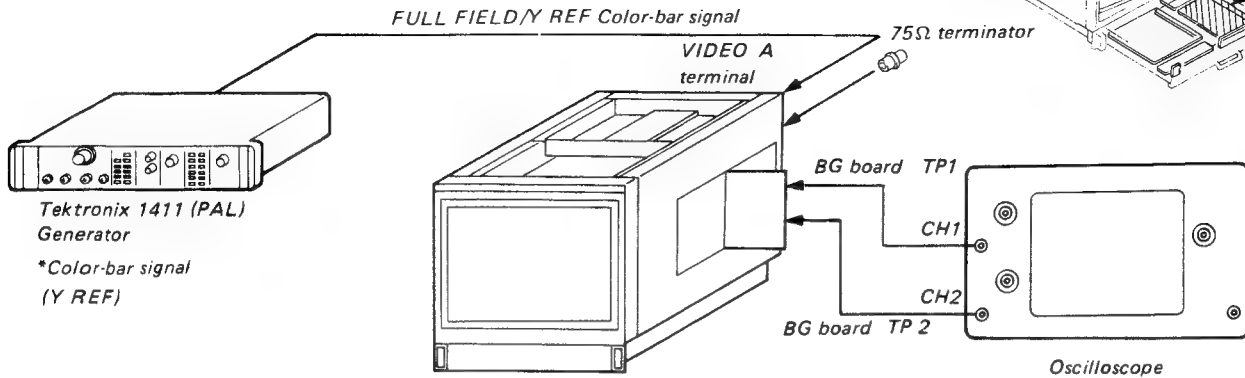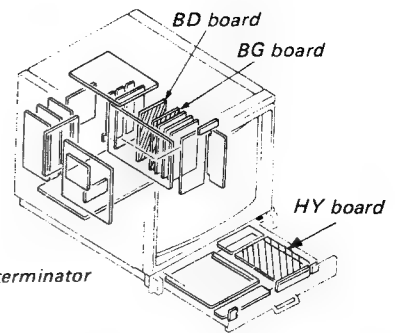
FULL FIELD/Y REF Color-bar signal

VIDEO A terminal

75Ω terminator

BD board
BG board
HY board

BG board TP1

CH1

CH2

BG board TP 2

Tektronix 1411 (PAL)
Generator

*Color-bar signal
(Y REF)

Oscilloscope

• PAL S/SECAM F/COMB S button
(SUB CONTPOL PANEL) .... ON

1. Input color-bar signal (FULL FIELD/Y REF) to the VIDEO
   A terminal of the set.

2. Connect an oscilloscope (CH-1 probe) to the TP1 of BG
   board and connect an oscilloscope (CH-2 probe) to the TP2
   of BG board (VERT mode of the oscilloscope is CHOP).

3. Adjust RV1 of BD board so that output waveform as shown
   in Fig. 26-1.

TP-2 (R-Y)

TP-1
(Y)

$\left(\begin{array}{c} A=B \\ C=D \end{array}\right)$

C = D

A = B

Fig. 26-1

Adjust RV1 so that E is equal to F.

TP2 (R-Y)

E = F

TP1 (Y)

BG Board

TP1
Y

TP2 R-Y
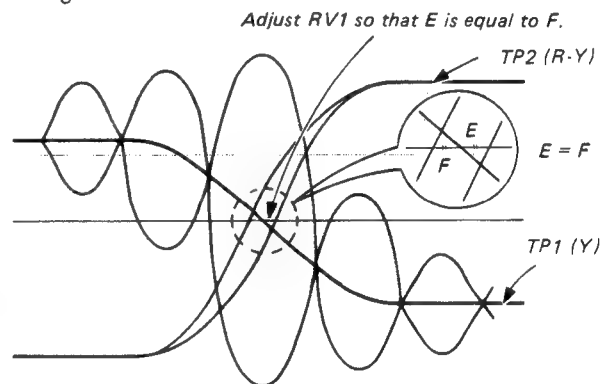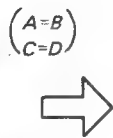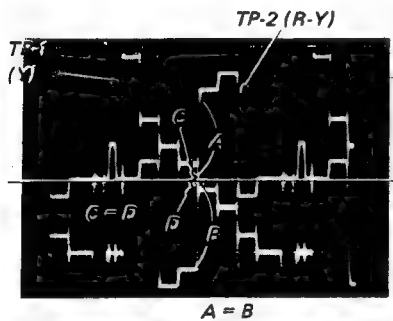
BD board

RV1
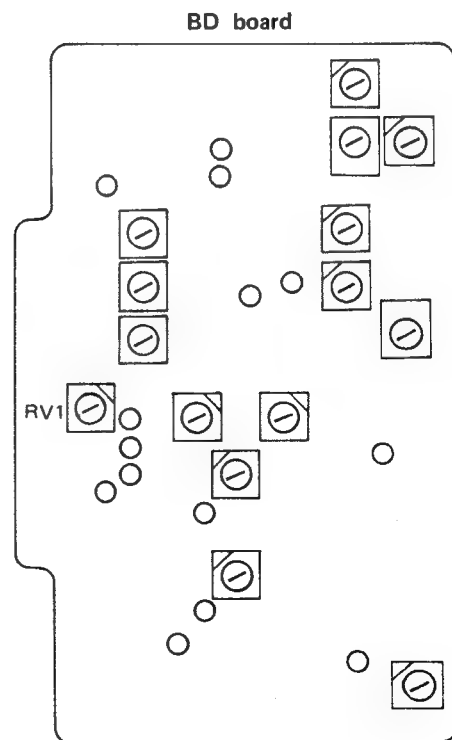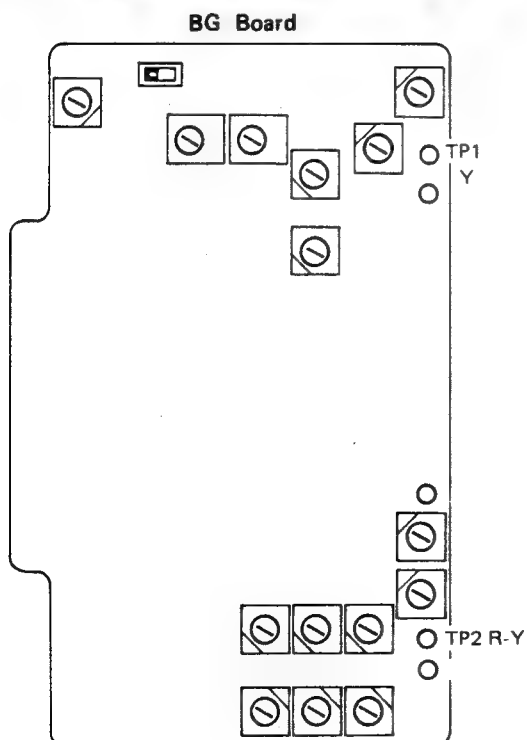
27. BD BOARD (PAL) 2T PULSE CORRECTION ADJUSTMENT (BVM-2011P ONLY)
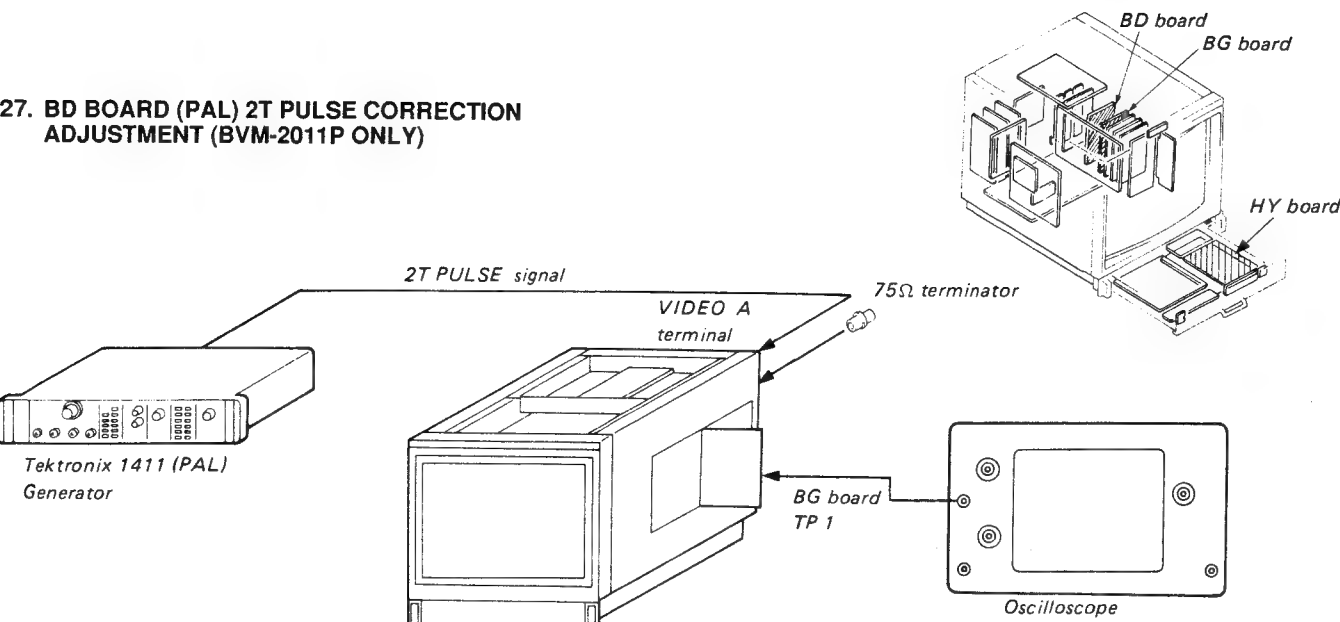
2T PULSE signal

VIDEO A terminal

75Ω terminator

Tektronix 1411 (PAL) Generator

BG board TP 1

Oscilloscope

1. Input 2T pulse signal to VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L2 of BD or BM board so that A is equal to B as shown in Fig. 27-1.

4. Change the input signal from 2T pulse to T pulse, and make sure the waveform balance is not lost extremely as shown in Fig. 27-1.

2T pulse

A   B

* Adjust L2 to obtain the condition A = B.

T pulse

A   B

* The waveform balance should not be lost extremely.

Fig. 27-1

BG board

○ TP1 Y

BD board

L2

4-77
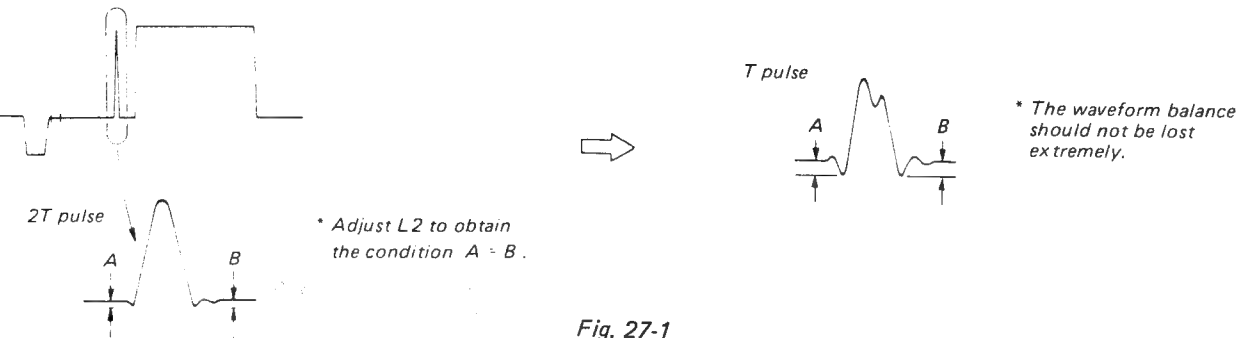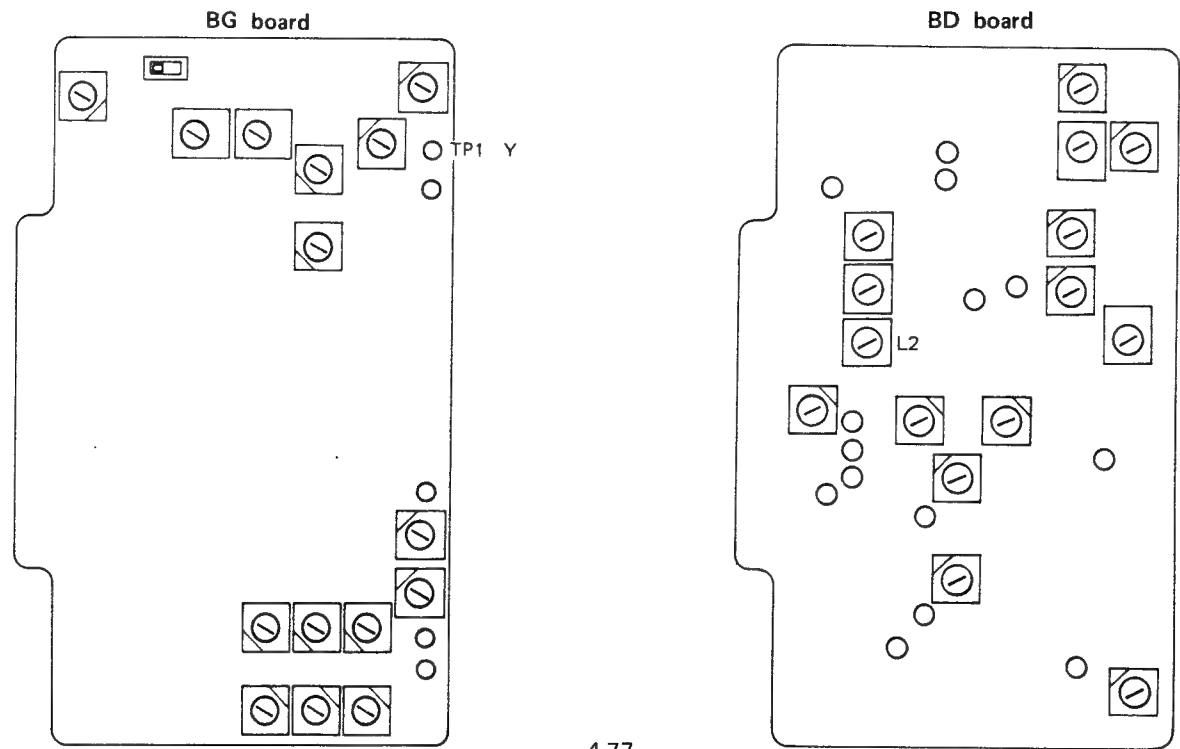
28. DA BOARD V. LEVEL ADJUSTMENT

Color-bar signal

VIDEO A terminal

75Ω terminator

DA board

Tektronix 1410 (NTSC)/1411 (PAL)
• NTSC color bar signal
(FULL FIELD color-bar
75% AMPL
100 IRE
7.5 IRE set up)
• PAL color bar signal
(FULL FIELD color-bar
75% AMPL
100 IRE)

DA board TP9
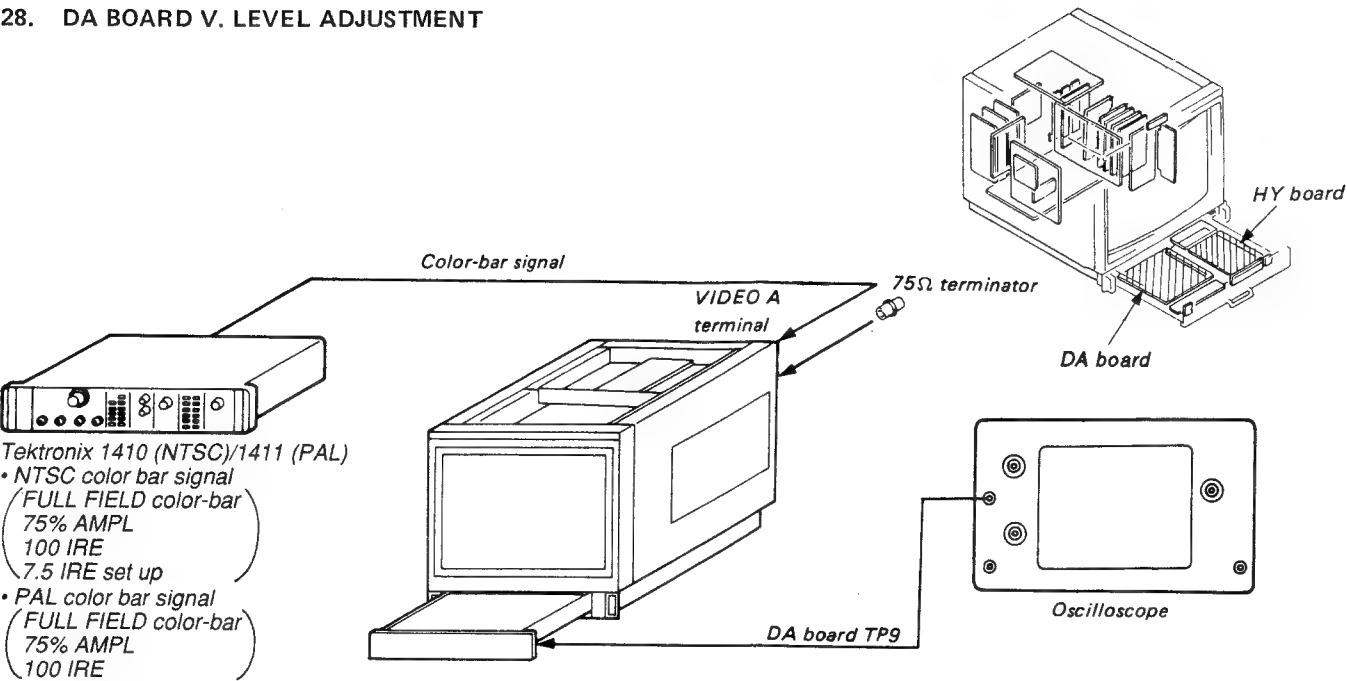
Oscilloscope

[PAL]

1. Input color-bar signal to the VIDEO A terminal of the set.
*2. Connect an oscilloscope to the TP9 on the DA board.
3. Adjust RV18 on the DA board so that output waveform is 12.0Vp-p as shown in Fig. 28-1.

The following adjustment is required when a NTSC system signal is received.

[NTSC]

4. Input color-bar signal (TEK-1410) to the VIDEO A terminal of the set.
5. Connect an oscilloscope to the TP9 on the DA board.
6. Adjust RV17 on the DA board so that output waveform is 12.0Vp-p.

12Vp-p

Fig. 28-1

DA board

RV18
V LEVEL
50Hz

RV17
V LEVEL
60Hz

TP9
V LEVEL

4-78
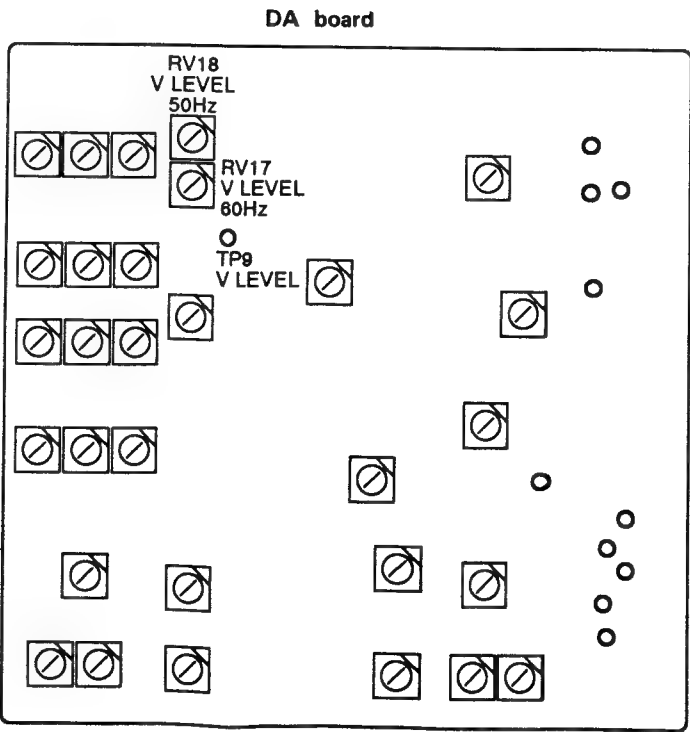
29. DA BOARD LINEARITY ADJUSTMENT

● **Linearity adjustment of 4:3 aspect picture.**
  ASPECT button ·················· 4:3 (HY board)
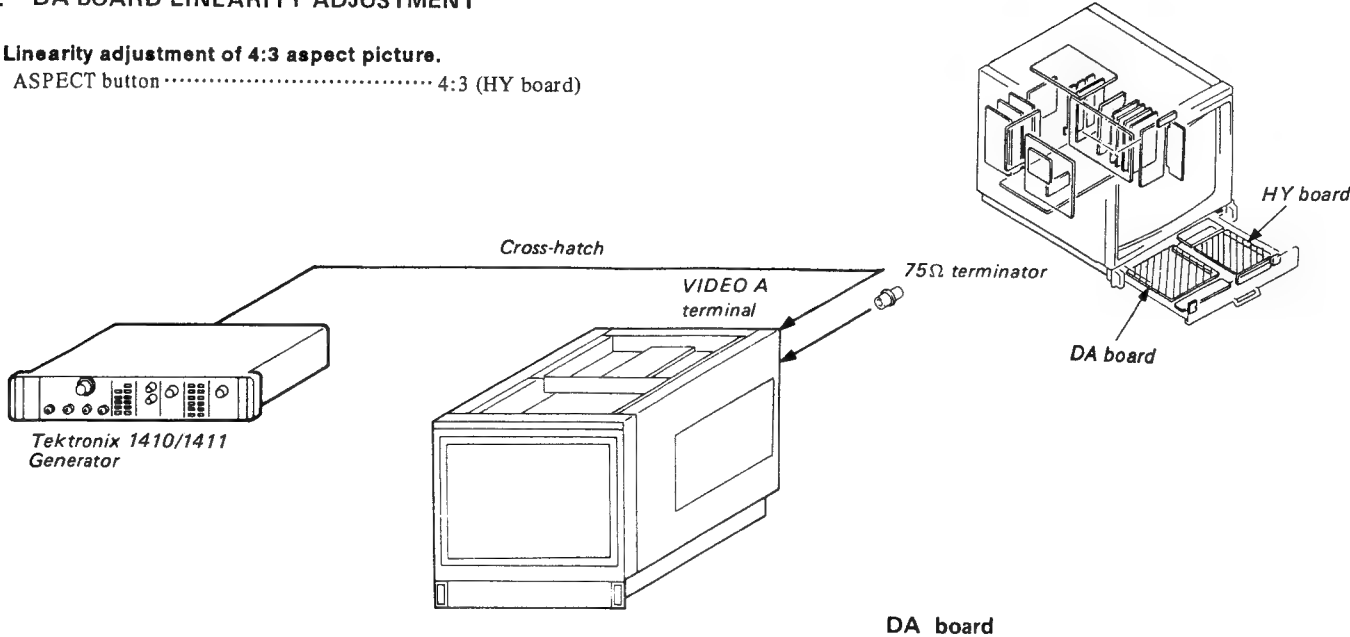
Cross-hatch

VIDEO A terminal

75Ω terminator

Tektronix 1410/1411 Generator

HY board

DA board

DA board

TOP AND BOTTOM PIN ADJUSTMENT

1. Receive cross-hatch signal and with H-LINE only.
2. Adjust T&B pin distortion H PHASE by turning DA board RV27 (TRAPEZOID) as shown in Fig. 29-1.
3. Adjust T&B pin distortion gain by turning DA board RV13 as shown in Fig. 29-1.
4. Adjust T&B pin distortion vertical balance by turning DA board RV10 as shown in Fig 29-1.
5. Adjust PARALLELO GRAM distortion by turning DA board RV28 (PARALLEL) as shown in Fig. 29-1.
6. Mark tracking by repeating 2 through 5.
7. UNDER SCAN switch (front panel) ·················· UNDER (▱)
8. Adjust T&B distortion gain by turning DA board RV14.
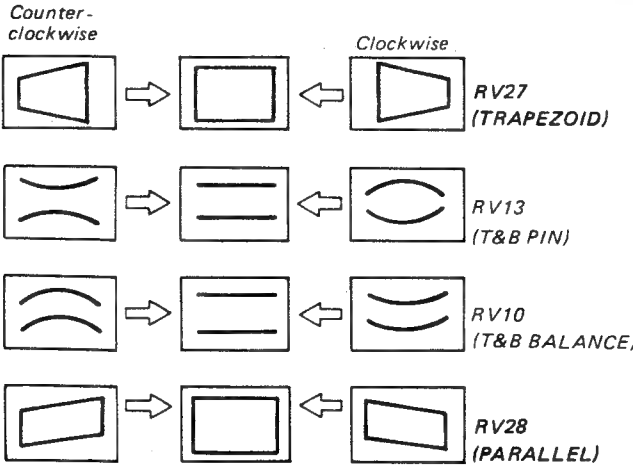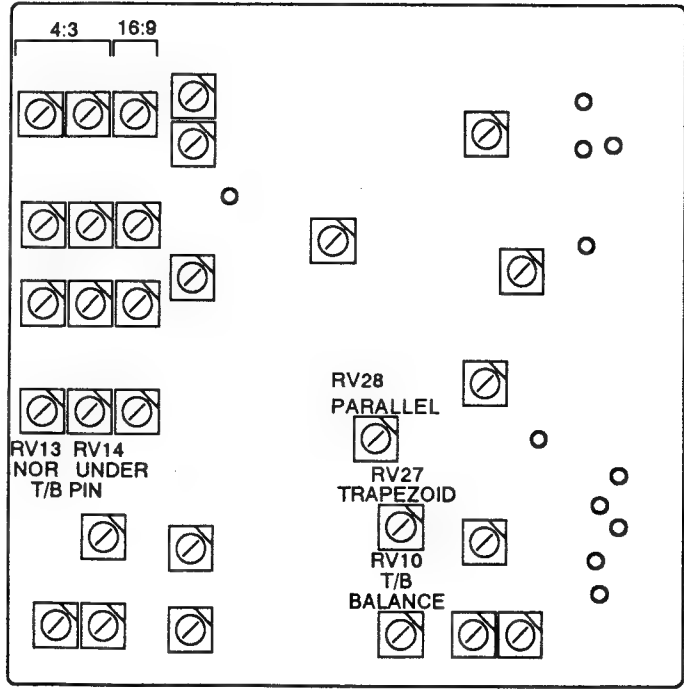
Counter-clockwise   Clockwise

RV27 (TRAPEZOID)

RV13 (T&B PIN)

RV10 (T&B BALANCE)

RV28 (PARALLEL)

Fig. 22-1

DA board

4:3 16:9

RV28 PARALLEL
RV13 RV14
NOR UNDER
T/B PIN
RV27 TRAPEZOID
RV10 T/B BALANCE

FRONT PANEL

AUTO SET UP PROBE   DEGAUSS   SCAN MODE   SCREEN R G B   APER-TURE BLUE ONLY MONO MODE   PHASE CHROMA BRIGHTNESS CONTRAST   OVER LOAD   INPUT 1 2   POWER   MANUAL 3 4

UNDER SCAN SW ▱
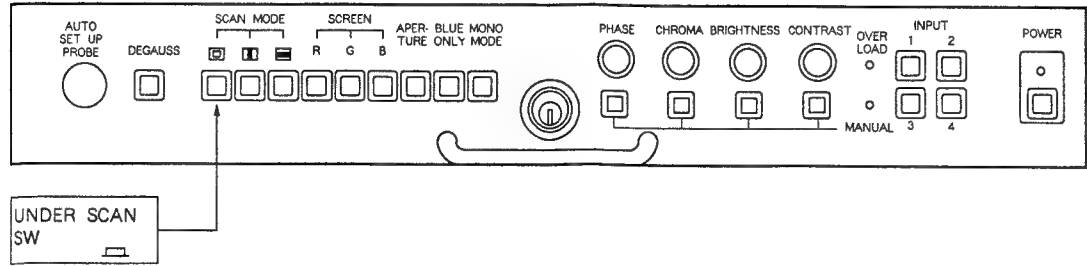
V. LINEARITY ADJUSTMENT

1. Receive cross-hatch signal and with H-LINE only.
2. Adjust V. CENTER by turning DA board RV21.
3. Adjust V. LIN BALANCE by turning DA board RV20 as shown in Fig. 29-2.
4. Adjust V. LIN GAIN by turning DA board RV22 as shown in Fig. 29-3.
5. Adjust V. HEIGHT by turning DA board RV23.
6. UNDER SCAN switch (Front panel) ..... UNDE (▱)
7. Adjust V. HEIGHT by turning DA board RV24.
8. Mark tracking by repeating steps 2. through 5.

RV20 ..... V LIN BALANCE

Counter-clockwise   Clockwise

Fig. 29-2

RV22 ..... V LIN GAIN

Counter-clockwise   Clockwise
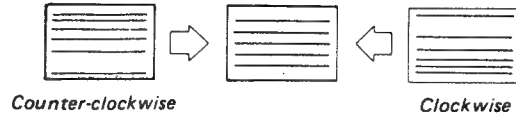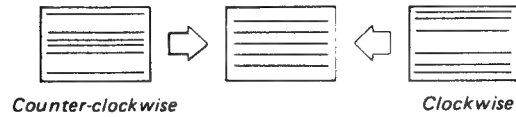
Fig. 29-3

SIDE PIN ADJUSTMENT

1. Receive cross-hatch signal and with V. LINE only.
2. **Adjust SIDE PIN by turning DA board RV15 as shown in Fig. 29-4.**
3. **Adjust SIDE PIN TILT by turning DA board RV19 as shown in Fig. 29-5.**
4. **Adjust H. CENTER LINE by turning DA board RV25 as shown in Fig. 29-6.**

RV15 (SIDE PIN)
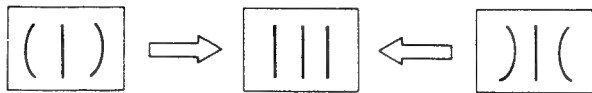
Fig. 29-4

RV19 (SIDE PIN TILT)

Fig. 29-5

RV25 (H. CENTER LINE)
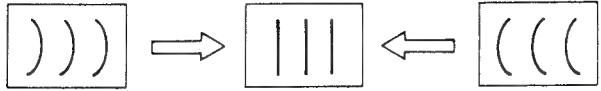
Fig. 29-6

5. UNDER SCAN switch (Front panel (L)) .... UNDER (▱)
6. Adjust SIDE PIN by turning DA board RV16.

H. LINEARITY ADJUSTMENT

1. Receive cross-hatch signal and with V-LINE only.
2. Adjust H. LINEARITY by turning DA board RV6 (H LIN GAIN) as shown in Fig. 29-7.

Fig. 29-7

FRONT PANEL

UNDER SCAN SW

DA board

4:3 16:9

V. HEIGHT
RV23 RV24
NOR UNDER

RV19
SIDE PIN
TILT

SIDE PIN
RV15 RV16
NOR UNDER

RV21
V. CENT

RV25
H. CENT
LIN

RV20
V. LIN
BALANCE

RV22
V. LIN
GAIN
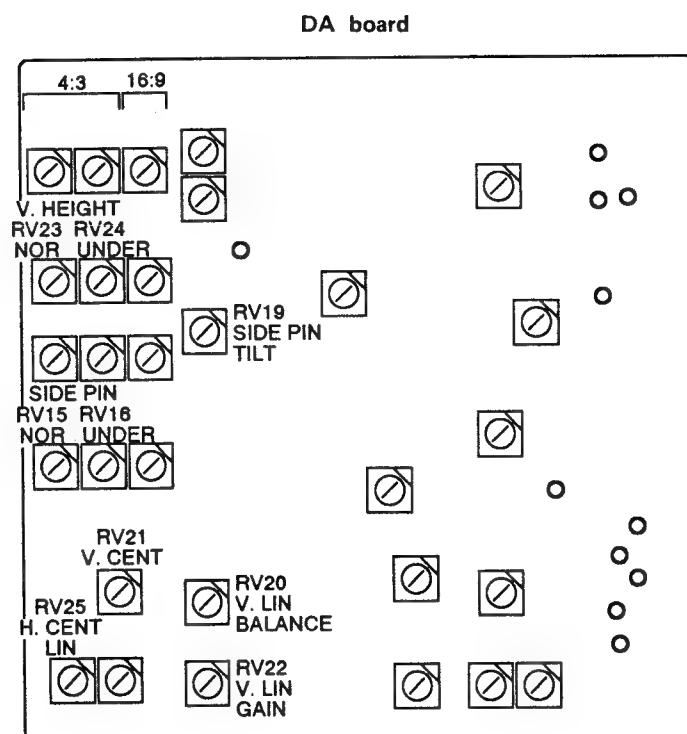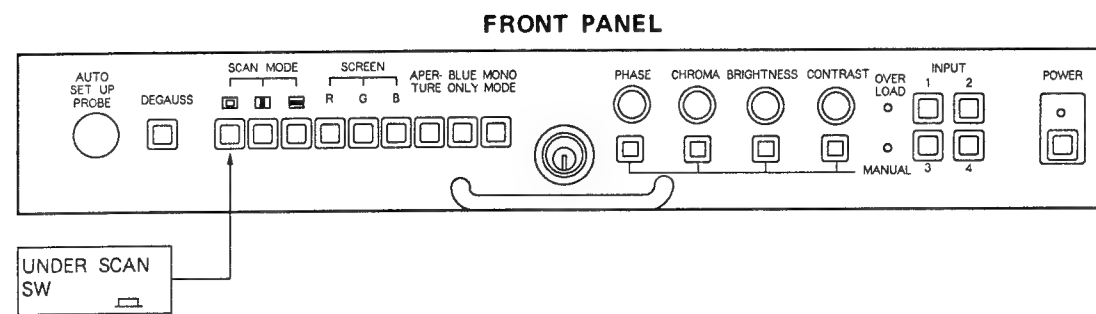
● **Linearity adjustment of 16:9 aspect picture.**

ASPECT button ······································ 16:9 (HY board)

NOTE:

● Adjust the convergence of the 16:9 aspect picture after convergence adjustment of the 4:3 aspect picture is completed.
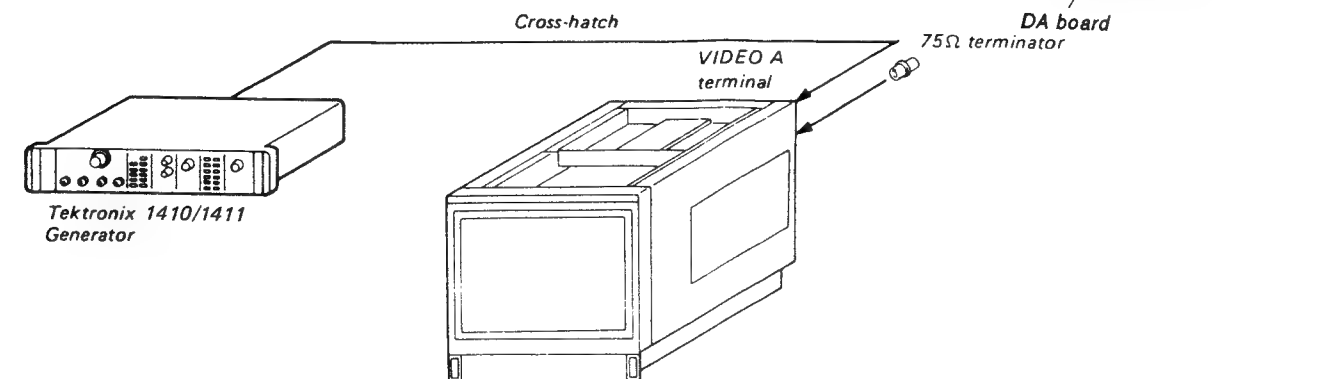
HY board

DA board
75Ω terminator

Cross-hatch

VIDEO A
terminal

Tektronix 1410/1411
Generator

TOP AND BOTTOM PIN ADJUSTMENT

1. Receive cross-hatch signal and with H-LINE only.
2. Adjust T&B pin distortion gain by turning DA board RV30 as shown in Fig. 29-8.

Counter clockwise

RV13
(T&B PIN)

Fig. 29-8

V. LINEARITY ADJUSTMENT

1. Receive cross-hatch signal and with H-LINE only.
2. Adjust V. HEIGHT by turning DA board RV32 as shown in Fig. 29-9.

Counter-clockwise   Clockwise

Fig. 29-9

SIDE PIN ADJUSTMENT

1. Receive cross-hatch signal and with V. LINE only.
2. Adjust SIDE PIN by turning DA board RV31 as shown in Fig. 29-10.

RV15 (SIDE PIN)
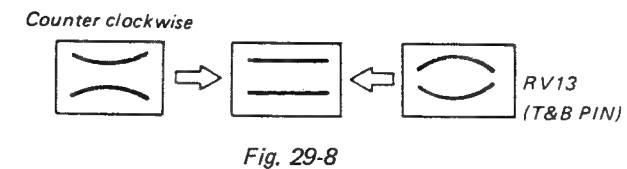
Fig. 29-10

H. LINEARITY ADJUSTMENT

1. Receive cross-hatch signal and with V-LINE only.
2. Adjust H. WIDTH by turning DA board RV29 as shown in Fig. 29-11.

Fig. 29-11

4:3 16:9   DA board

H. WIDTH
RV29

V. HEIGHT
RV32

RV31
SIDE PIN

RV30
T/B PIN
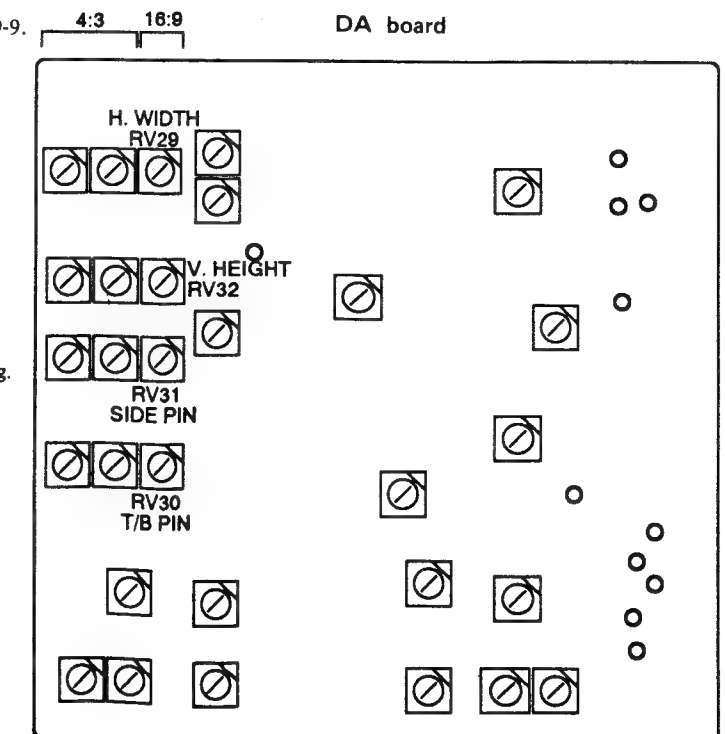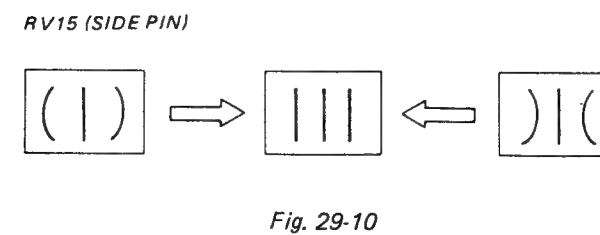
30. H. FREQ ADJUSTMENT

1. Receive cross-hatch signal, and SYNC selector to EXT (⌐)
2. Adjust until the picture stops drifting or moves slowly by turning DA board RV5 as shown in Fig. 30-1.
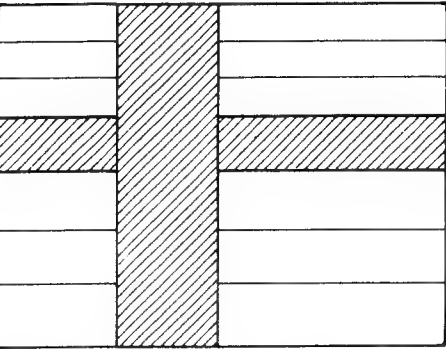
* Adjust so that the picture either stops drifting or moves slowly.

Fig. 30-1

31. DA BOARD H. CENTER, BLK, H.PHASE ADJUSTMENT

1. Receive monoscope signal, and UNDER SCAN switch to UNDER (⌐).
2. Picture tube
   ● V. DELAY switch . . . . IN (⌐)
3. Adjust RV1 and RV7 on the DA board so that the raster can all be seen by RV1 and RV7 as shown in Fig. 31-1.

H. CENTER

4. Adjust RV26 on the DA board so that the out side portions of the raster become equal to at the right and the left sides as shown in Fig. 31-1.
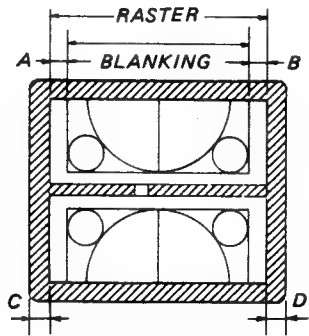
Fig. 31-1

H. BLK Adjustment

5. Connect an oscilloscope to the TP1 on the DA board.
6. Adjust RV1 on the DA board so that the H. BLK pulse width is 9.8 μs. Fig. 31-2.
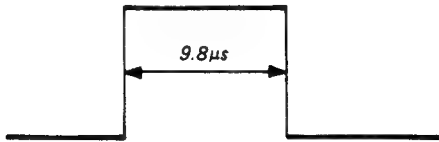
Fig. 31-2

H. BLK PHASE Adjustment

7. Adjust RV7 on the DA board so that the blanking width at the right and the left sides are equal to as shown in Fig. 31-3.

monoscope pattern
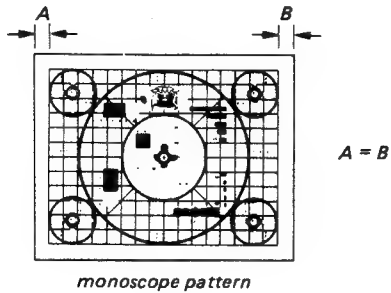
Fig. 31-3

H. PHASE Adjustment

8. Adjust RV4 on the DA board so that the outside raster portions of the picture become equal at the right and the left sides as shown in Fig. 31-4.

monoscope pattern

Fig. 31-4

FRONT PANEL
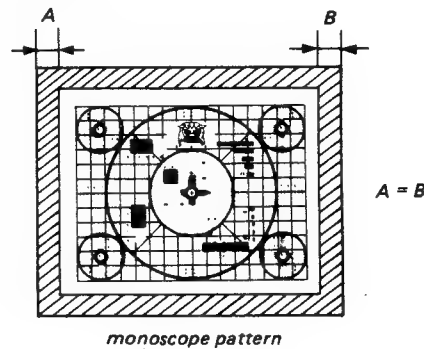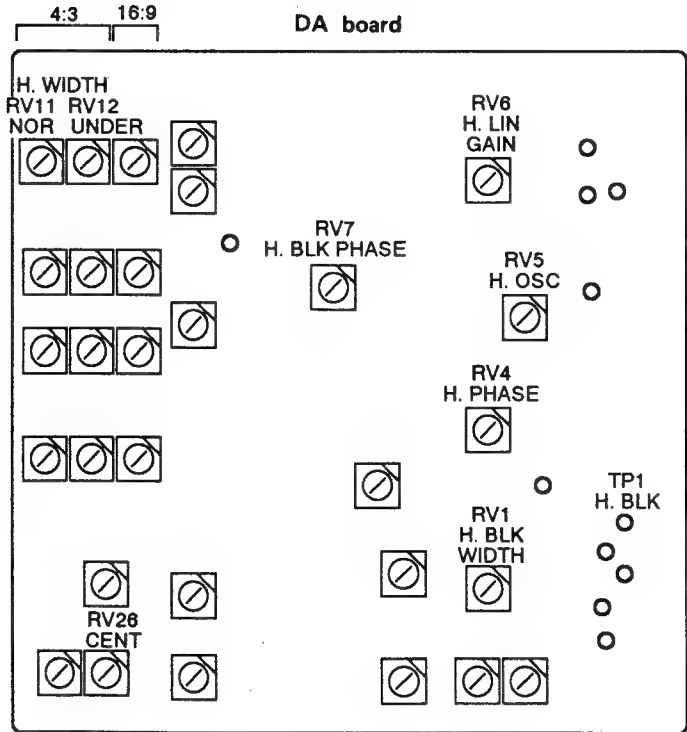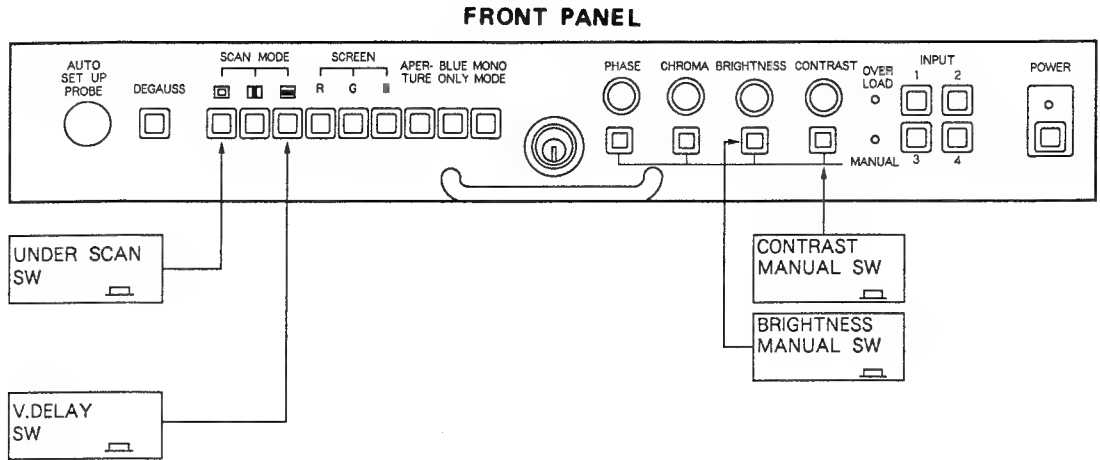
DA board

32. DA BOARD H DELAY POSITION ADJUSTMENT

Color-bar signal

VIDEO A
terminal

75Ω terminator

HY board

DA board

Fig. 32-1

Tektronix 1410 (NTSC)/1411 (PAL)
• NTSC color bar signal
/FULL FIELD color-bar\
75% AMPL
100 IRE
\7.5 IRE set up /
• PAL color bar signal
/FULL FIELD color-bar\
75% AMPL
\100 IRE /

1 V (75Ω)

FULL FIELD COLOR-BAR
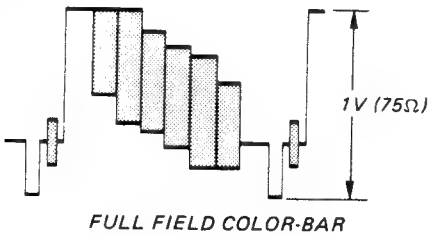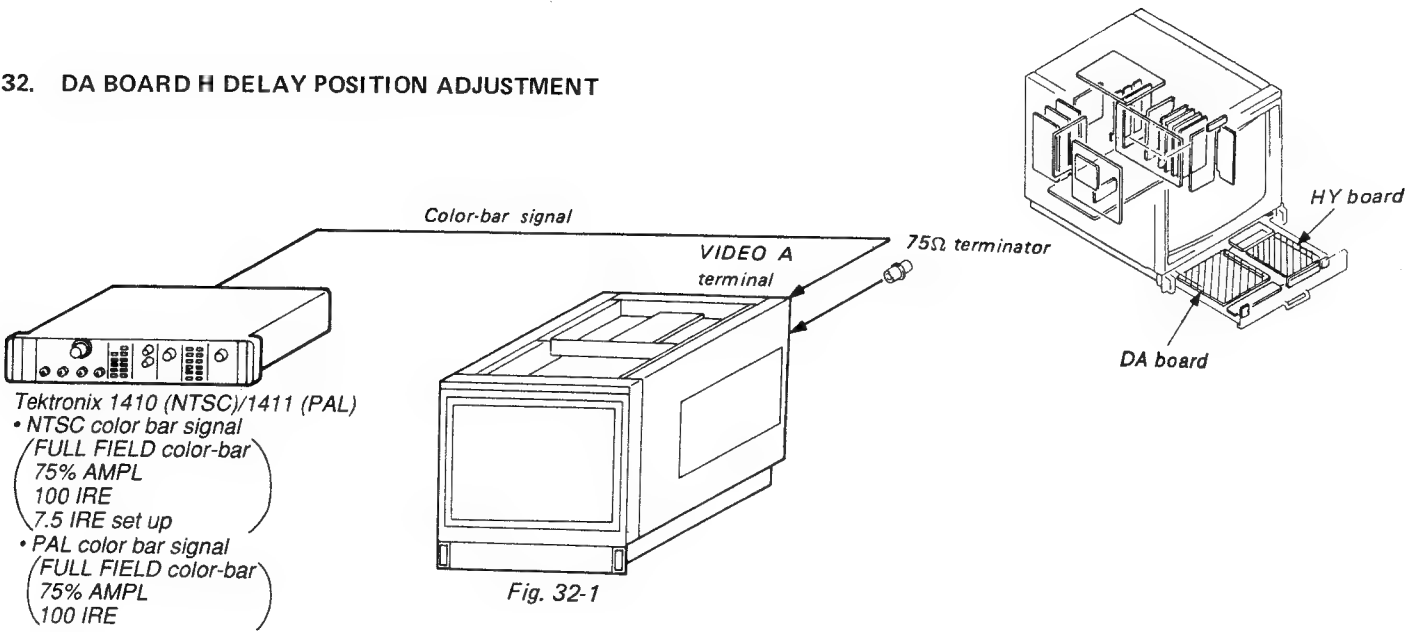
H. DELAY PULSE WIDTH ADJUSTMENT
1. Connect an oscilloscope to the TP2 on the DA board.
2. Adjust RV3 on the DA board so that PULSE width is equal when switching H-DELAY switch IN and OUT.

H. DELAY POSITION
1. Connect as shown in Fig. 32-1.
2. Turn the INPUT selector to "1" (⊏⊐) SYNC button "INT" and, H DELAY & V DELAY SW to "IN" (⊏⊐) (pulse close position).
3. Adjust the H-DELAY position as shown in Fig. 32-2 by turning DA Board RV2.

A ⟶ Make these distances equal. ⟶ B
(Adjust RV2 so that A=B.)

Fig. 32-2

4:3 16:9   DA board

TP2
D. AFC P

RV3
H. DELAY
P WIDTH

RV2
H. DELAY
POSITION

FRONT PANEL

AUTO SET UP PROBE   DEGAUSS   SCAN MODE   SCREEN R G B   APER-TURE   BLUE ONLY   MONO MODE   PHASE   CHROMA   BRIGHTNESS   CONTRAST   OVER LOAD   INPUT 1 2   POWER

MANUAL 3 4

H.DELAY SW
⊏⊐ IN   ☐ OUT

V.DELAY
SW
⊏⊐
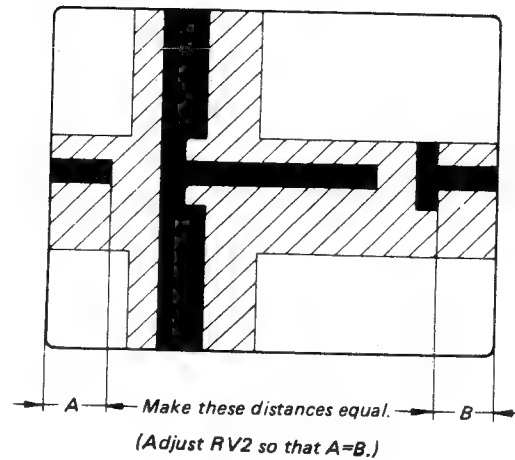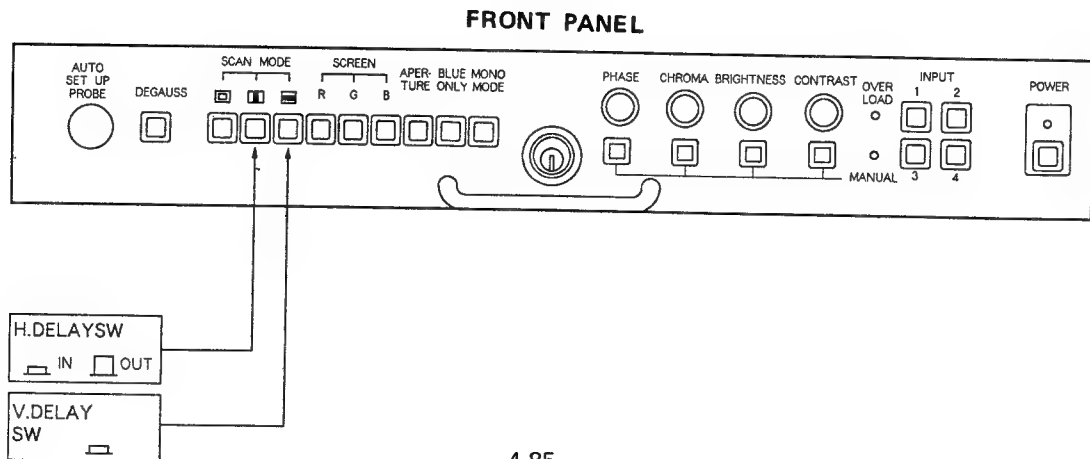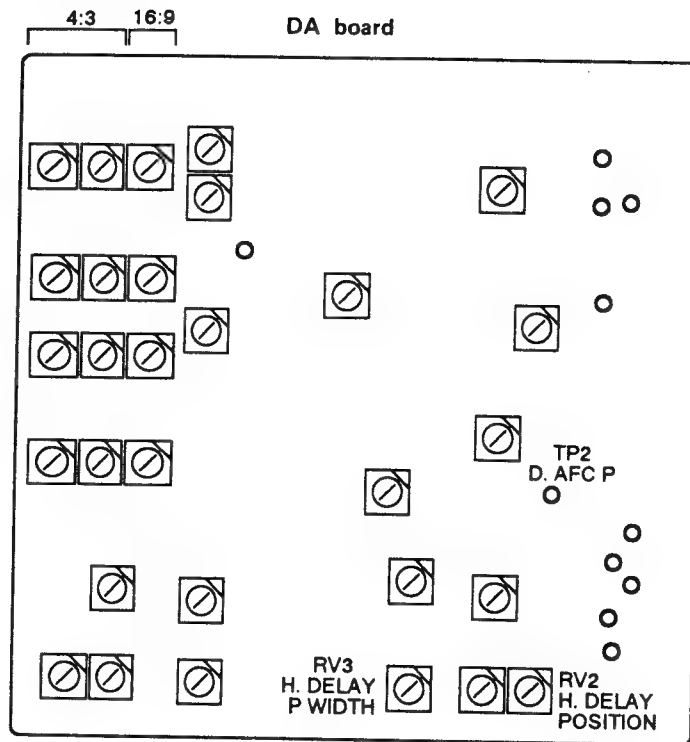
SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM
SIGNAL PROCESSING BLOCK DIAGRAM

5-2. FRAME WIRING DIAGRAM
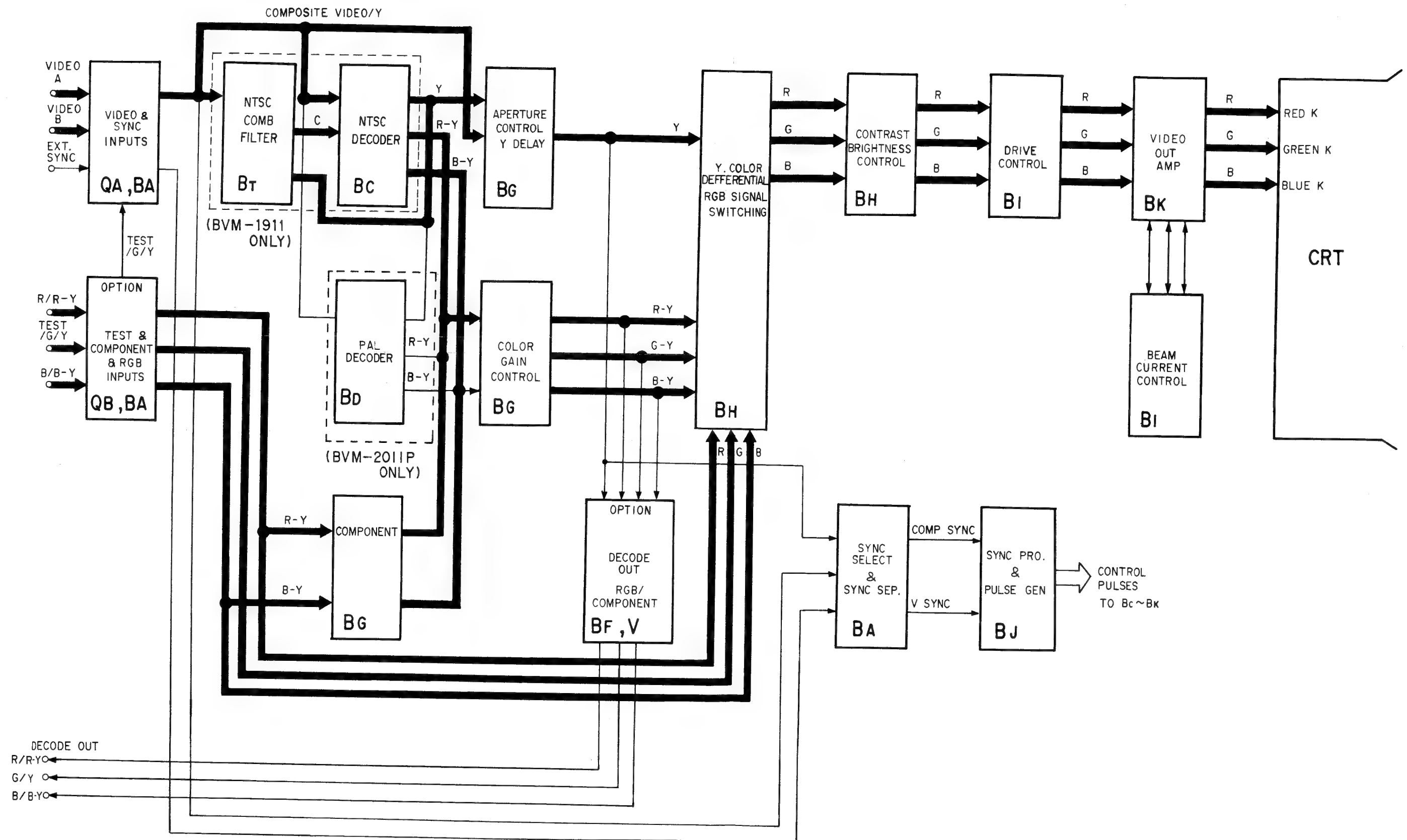
5-3. MOUNTING AND SCHEMATIC DIAGRAMS

Note:

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et par une marque ⚠ sont d'une importance critique pour la sécurité. Ne les remplacer que par des pièces de numéro spécifié.

- All capacitors are in µF unless otherwise noted. p : µµF
  50 WV or less are not indicated except for electrolytics.

- All resistor are in ohms, 1/2W on the C board,
  1/10W on the BT, DC, HY, and HZ boards and 1/4W
  on the rest of the boards unless otherwise specified.
  kΩ = 1000Ω, MΩ = 1000kΩ

- ⊏ww⊐ : nonflammable resistor.

- △ : internal component.

- ⏚ : direct connection to points marked ⏚ on the chassis

- ☐ : panel designation.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

- The components identified by ▤ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
  When replacing components identified by ▤, make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by ▤ and repeat the adjustment until the specified value is achieved.
  Refer to R52, R53, R67, R68, R124, R126, R222, R227, R228 and R239.
  Adjust on page 4-13 ~ 4-18.
  When replacing the part in below table, be sure to perform the related adjustment.

Reference information

RESISTOR	:	RN	METAL FILM
	:	RC	SOLID
	:	FPRD	NONFLAMMABLE CARBON
	:	FUSE	NONFLAMMABLE FUSIBLE
	:	RS	NONFLAMMABLE WIREWOUND
	:	RB	NONFLAMMABLE CEMENT
COIL	:	LF-8L	MICRO INDUCTOR
CAPACITOR:		TA	TANTALUM
	:	PS	STYROL
	:	PP	POLYPROPYLENE
	:	PT	MYLAR
	:	MPS	METALIZED POLYESTER
	:	MPP	METALIZED POLYPROPYLENE
	:	ALB	BIPOLAR
	:	ALT	HIGH TEMPERATURE
	:	AIR	HIGH RIPPLE

Part replaced (▤)	Adjustment (▤)
C59, IC3, R67, R68, R78, RV2 . . . (GA board)	B+ MAX (R67, R68) Page 4-13.
Q13, Q14, R52, R53 (GA board) D5, D6, D7, D8, Q3, Q4, Q5, R4, R5, R19, R20, R21, R22 . . . (GB board)	B+ PROTECTER (R52, R53) Page 4-13.
D216, IC1, IC4, R123, R124, R125, R126, R136, R137, R138, R203, R204, RV1 . . . (PA board) DCT BLOCK	HV REG (R124, R126) Page 4-18.
D205, D207, D214, D215 IC2, R201, R202, R213, R214, R225, R226, R227, R228, R229, R230, R243, R245 . . . . (PA board) DCT BLOCK	HV HOLD DOWN (R227, R228) Page 4-16.
D205, D206, D215, IC2, R201, R202, R213, R214, R220, R221, R222, R223, R224, R242 . . . (PA board) T1 (FBT), R1, R2, R5 . . . . (PB board)	BEAM CURRENT PROTECTER-1 (R222) Page 4-13 ~ 4-16
D204, D216, IC3, R203, R204, R231, R232, R237, R238, R239, R240, R241, R247 . . . (PA board) T1 (FBT), R3, R4, R5, R6 . (PB board)	BEAM CURRENT PROTECTER-2 (R239) Page 4-14 ~ 4-15

- ☐ adjustment for repair.

- ⸺ B+ bus.

- - - - B - bus.

- Circled numbers are waveform references.

- Waveforms are taken with a color-bar signal input and with a 75Ω terminator connected to an open terminal.

- Switches and controls are set as follows unless otherwise noted.

FRONT PANEL
- INPUT selector 1   ⎤ HX board
- CONTRAST MANUAL switch ...... PRESET   ⎦
- BRIGHTNESS MANUAL switch ... PRESET   ⎤
- CHROMA MANUAL switch .... PRESET   ⎬ HW board
- PHASE MANUAL switch .... PRASET   ⎦
- SCAN MODE switch
    ▣ UNDER SCAN .... NOR   ⎤
    ▥ H. DELAY .... NOR   ⎬
    ▤ V. DELAY .... NOR   ⎦
- SCREEN switch (R) .... NOR   HA board
- SCREEN switch (G) .... NOR
- SCREEN switch (B) .... NOR
- APT switch .... NOR
- BLUE ONLY switch .... NOR
- MODE selector .... AUTO   ⎦

SUB CONTROL PANEL
- FORMAT button .... CODED   ⎤
- INPUT button .... A
- SYNC button .... INT
- COLOR SYSTEM button .... NTSC (BVM-1311/1911)
                                                       PAL (BVM-1411P/2011P)
- YC SEP button .... COMB (BVM-1311/1911)
                                                       TRAP (BVM-1411P/2011P)
- WHITE BALANCE button D65/D93
- ASPECT button .... 4 : 3   ⎬ HY board
- PIC SETUP button .... OFF
- SAD/VITC/MARKER button .... OFF
- FILTER button .... OFF
- MATRIX button .... OFF
- PAL S/SECAM F/COMB S button .
   .... OFF   ⎦
- CROSS HATCH button .... OFF
- SPLIT SCREEN button .... OFF
- WHITE button .... OFF
- GRAY button .... OFF
- AFC switch .... 2m sec   DA board

Note:

- ▨ : Pattern from the side which enables seeing.

- ▨ : Pattern of the rear side.

TA board (MOTHER BOARD)

: Pattern from the side which enables seeing.

: Pattern of the rear side.

5-7

5-8

TA board (MOTHER BOARD)

TO DB-3   TO CY

GND DCT DRIVE CY DRIVE TA-2   CY OUT CY IN TA-1

PA-15 (PA)				TA-14 (EB)				TA-13 (EA)			
GND	B1	A1	GND	GND	B1	A1	GND	GND	B1	A1	GND
	B2	A2		CY.OUT	B2	A2	CY.OUT	H.DRIVE	B2	A2	H.DRIVE
H.PULSE	B3	A3	H.PULSE	CY.NF	B3	A3	CY.NF	D.F.P	B3	A3	D.F.P
V.OUT.P	B4	A4	V.OUT.P	CY.D	B4	A4	CY.D	H.CENT(1)	B4	A4	H.CENT(1)
	B5	A5			B5	A5		H.CENT(3)	B5	A5	H.CENT(3)
	B6	A6			B6	A6		H.C.LIN(1)	B6	A6	H.C.LIN(1)
	B7	A7		DF	B7	A7	D.F	H.C.LIN(3)	B7	A7	H.C.LIN(3)
	B8	A8			B8	A8		H.CENT(2)	B8	A8	H.CENT(2)
HV.REG	B9	A9	HV.REG	D.F.P	B9	A9	D.F.P	H.C.LIN(2)	B9	A9	H.C.LIN(2)
	B10	A10		DCT.OUT	B10	A10	DCT.OUT		B10	A10	
	B11	A11		DCT.D	B11	A11	HCT.D		B11	A11	
G2 CONT	B12	A12	G2 CONT	V.SAW	B12	A12	V.SAW		B12	A12	
+18V	B13	A13	+18V	T/B PIN	B13	A13	T/B PIN		B13	A13	
IHV(3)	B14	A14	IHV(3)	V.D	B14	A14	V.D		B14	A14	
IHV(2)	B15	A15	IHV(2)	V.OUT(DY)	B15	A15	V.OUT(DY)	H.LIN	B15	A15	H.LIN
IHV(1)	B16	A16	IHV(1)	V.OUT(DY)	B16	A16	V.OUT(DY)	H.P	B16	A16	H.P
HV.PROT	B17	A17	HV.PROT	V.NF(DY)	B17	A17	V.NF(DY)	H.WIDTH	B17	A17	H.WIDTH
	B18	A18		V.NF(DY)	B18	A18	V.NF(DY)	SIDE PIN	B18	A18	SIDE PIN
+150V	B19	A19	+150V	+150V	B19	A19	+150V	+150V	B19	A19	+150V
+18V	B20	A20	+18V	+18V	B20	A20	+18V	+18V	B20	A20	+18V
-18V	B21	A21	-18V	-18V	B21	A21	-18V	-18V	B21	A21	-18V
GND	B22	A22	GND	GND	B22	A22	GND	GND	B22	A22	GND

TA-5

H.CENT (1)
H.CENT (2)
H.CENT (2)   TO DA-6
H.C.LIN (1)
H.C.LIN (2)
H.C.LIN (3)

D.F   TO FOCUS VR   TA-12

DCT.OUT   TO DCT
GND   TA-8

H.LIN   TO DA-4
SIDE PIN
H.WIDTH
H.DRIVE
H.P
GND   TA-7

+150V   TO GA-8
GND
+18V
GND
-18V   TA-4

TO TB-11 TA-6
GND
I.ABL
TA-9
+18V
TO PB +18V
GND
IHV(3)
IHV(2)
IHV(1)

TO DCT +18V
+18V
HV.REG
GND
HV.PROT
GND   TA-10

T_A

V.OUT.PULSE V.OUT V.OUT V.NF V.NF TA-11

TO V.DY

GND V.D T/B PIN V.SAW TA-3

TO DA-7

TB board (MOTHER BOARD)

: Pattern from the side which enables seeing.

: Pattern of the rear side.

TB board (MOTHER BOARD)

TB (MOTHER BOARD)

BA board (SYNC SELECT & SYNC SEP, HOOK UP)

IC							2	3		1	
Q	717 716	715 714 710	713 708 711 709 712	707	704 706 703 705 702 701	5 6	3 4	2 1	
	605 604 603 602 601	505 504 503 502 501		405 404 403 402 401	305 304 303 302 301		205 204 203 202 201	105 104 103 102 101	
D		708 707 706 703 705 710 704		101 709 702	4		1	2	
TP ADJ	TP702 TP601 RV601 CV602 CV601	TP701 RV501 CV502 CV501		TR401 RV401 CV402 CV401	TP2	RV201 CV202 CV201	TP501 RV101 CV102 CV101	TP1 TP201 TP101	
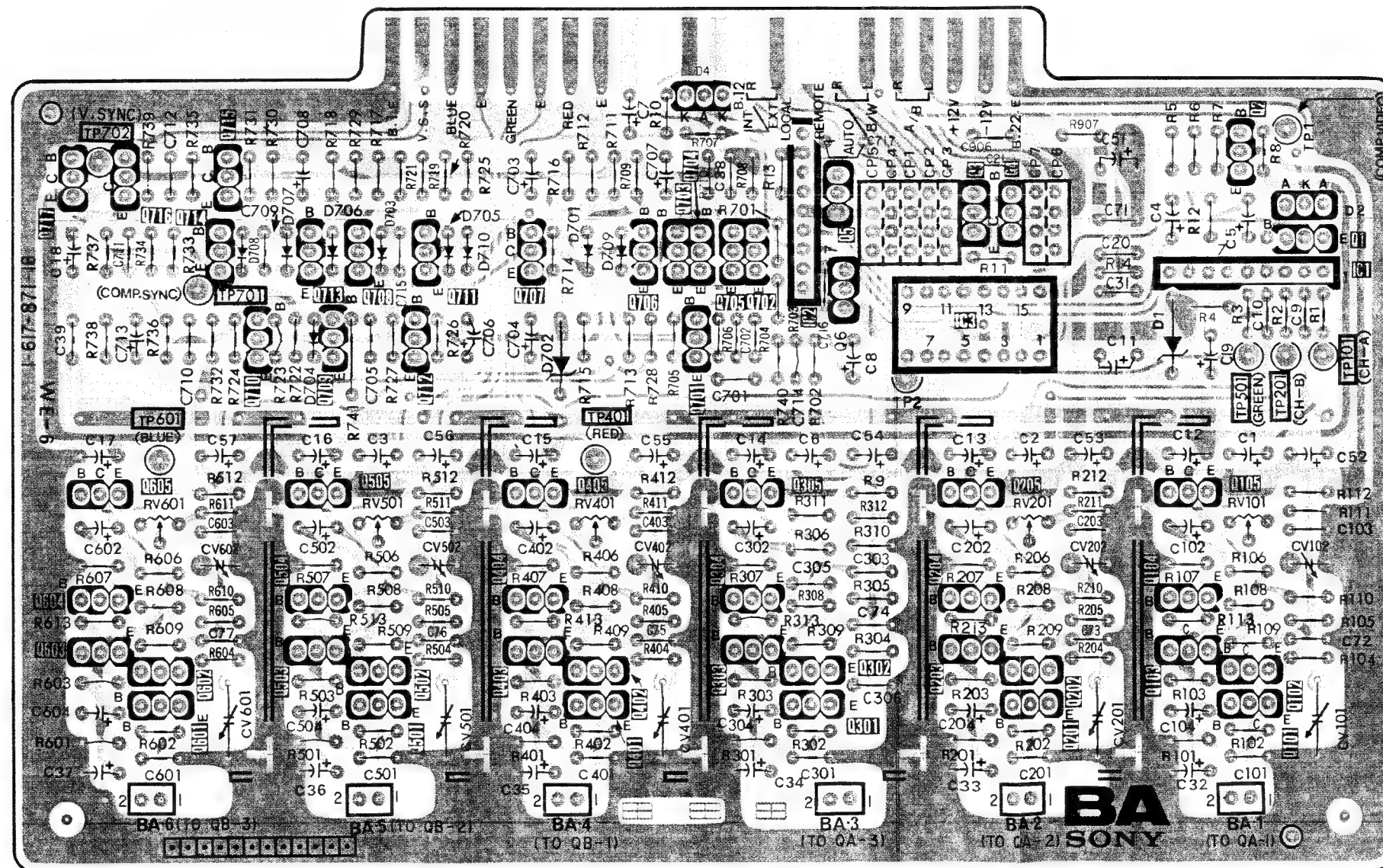
: Pattern from the side which enables seeing.

: Pattern of the rear side.

BA board (SYNC SELECT & SYNC SEP, HOOK UP)
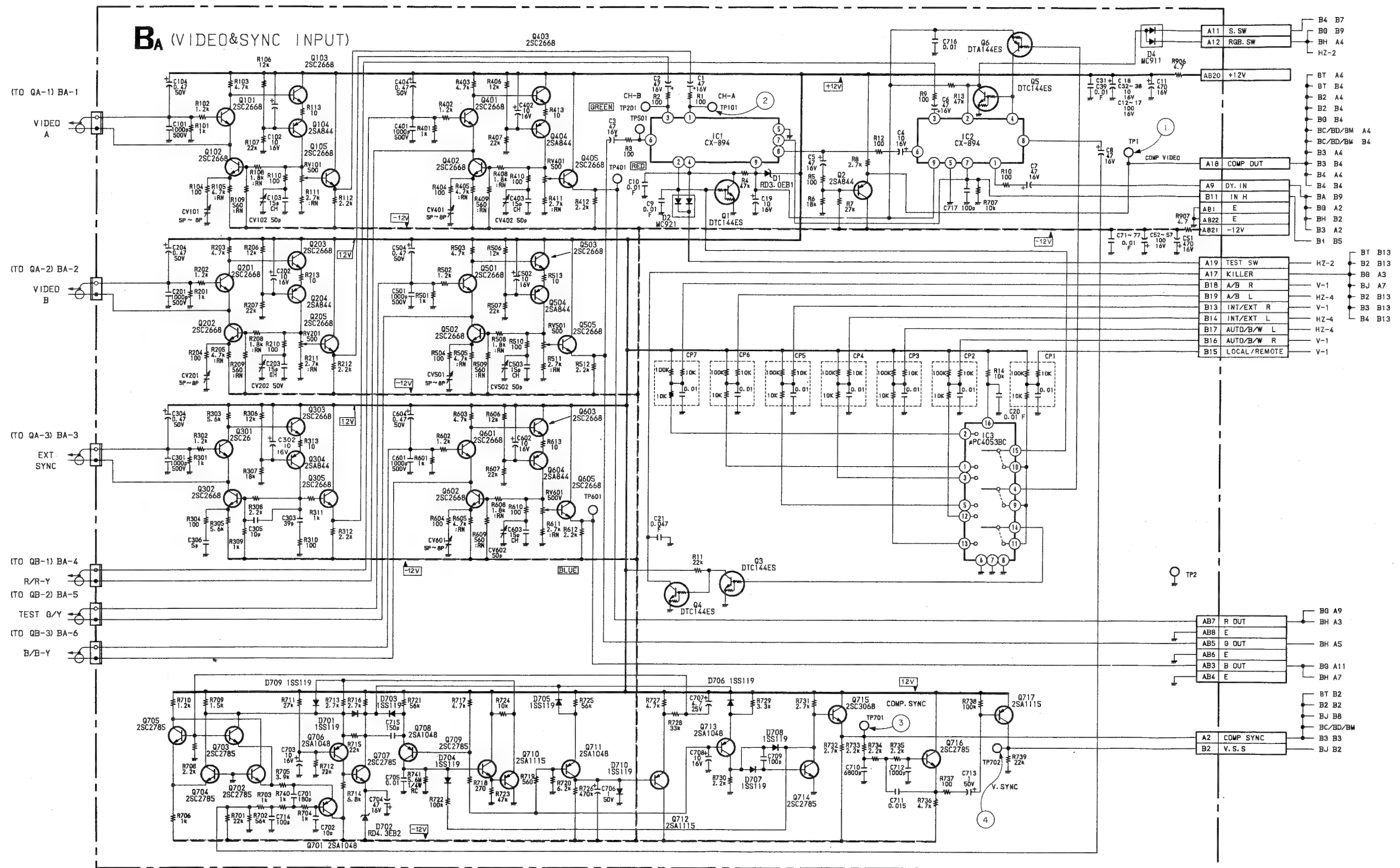
BA BOARD

IC1	CX894	INPUT SELECT
2	CX894	SYNC SELECT
3	MC14053BCP	LOCAL/REMOTE SW
Q1	DTC144ES	INPUT SELECT CONTROL
2	2SA844	BUFF
3	DTC144ES	KILLER
4	DTC144ES	KILLER
5	DTC144ES	SYNC SELECT CONTROL
6	DTA144ES	INT/EXT CONTROL
101	2SC2668	VIDEO A AMP
102	2SC2668	VIDEO A AMP
103	2SC2668	VIDEO A AMP
104	2SA844	VIDEO A AMP
105	2SC2668	VIDEO A AMP
201	2SC2668	VIDEO B AMP
202	2SC2668	VIDEO B AMP
203	2SC2668	VIDEO B AMP
204	2SA844	VIDEO B AMP
205	2SC2668	VIDEO B AMP
301	2SC2668	EXT SYNC AMP
302	2SC2668	EXT SYNC AMP
303	2SC2668	EXT SYNC AMP
304	2SA844	EXT SYNC AMP
305	2SC2668	EXT SYNC AMP
401	2SC2668	R-Y/R AMP
402	2SC2668	R-Y/R AMP
403	2SC2668	R-Y/R AMP
404	2SA844	R-Y/R AMP
405	2SC2668	R-Y/R AMP
501	2SC2668	TEST/Y/G AMP
502	2SC2668	TEST/Y/G AMP
503	2SC2668	TEST/Y/G AMP
504	2SA844	TEST/Y/G AMP
505	2SC2668	TEST/Y/G AMP
601	2SC2668	B-Y/B AMP
602	2SC2668	B-Y/B AMP

Q603	2SC2668	B-Y/B AMP
604	2SA844	B-Y/B AMP
605	2SC2668	B-Y/B AMP
701	2SA1048	SYNC AGC
702	2SC2785	SYNC AGC
703	2SC2785	SYNC AGC
704	2SC2785	SYNC AGC
705	2SC2785	SYNC AGC
706	2SA1048	SYNC AGC
707	2SC2785	SYNC AGC
708	2SA1048	SYNC AGC
709	2SC2785	SYNC AGC
710	2SA1115	SYNC AGC
711	2SA1048	SYNC AGC
712	2SA1115	SYNC AGC
713	2SA1048	COMP SYNC SEP
714	2SC2785	COMP SYNC SEP
715	2SC3068	COMP SYNC SEP
716	2SC2785	V SYNC SEP
717	2SA1115	V SYNC SEP
D1	RD3.0E-B1	+9V REG
2	MC921	INPUT SELECT CONTROL
4	MC911	SYNC SELECT CONTROL
701	1SS119	SYNC AGC
702	RD4.3E-B2	-7.5V REG
703	1SS119	SYNC AGC
704	1SS119	SYNC AGC
705	1SS119	SYNC AGC
706	1SS119	SYNC AGC
707	1SS119	COMP SYNC SEP
708	1SS119	COMP SYNC SEP
709	1SS119	SYNC AGC
710	1SS119	SYNC AGC

5. DIAGRAMS
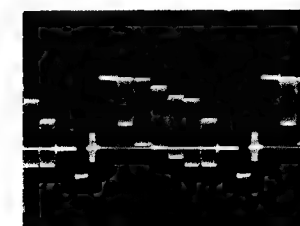
1 1Vp-p (H)
2 1Vp-p (H)
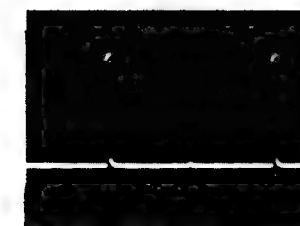
4 12 Vp-p (V)

3 12Vp-p (H)

BT board (3 LINE DYNAMIC COMB FILTER, 2 LINE SIMPLE COMB FILTER, BPF)
(BVM-1911 ONLY)

IC	311 4 1 331				2	
	321 3 341				501	
	351 361					

(component designator map — Q/D/ADJ/TP rows)

Row	Designators
Q	1 2 25 16 84 83 82 81 85 3 4 14 13 12 24 86 20 5 8 11 23 22 18 21 19 32 6 7 15 34 36 9 17 45 33 35 56 10 39 41 42 44 52 54 37 38 59 40 31 51 73 74 72 71 57 58 60 61 62 43 65
D	311 321 1 341 3 6 9 2 5 4 7 8 351 361 331
ADJ	CV3 CV4 CV6 RV4 CV5 RV2 RV3 RV9 RV5 RV8 RV7 RV6 RV1 RV12 CV1 RV10 CV2 RV11
TP	10 14 2 15 3 1 8 11 6 9 7 4 5 13 12

5-20

BT BOARD

IC 1	LA7816	Y SELECT
2	LA7816	C SELECT
3	NJM7809FA	9V REG
4	NJM7805FA	5V REG
331	CXL1009P	CCD
341	CXL1009P	CCD
361	CXL1009P	CCD
501	CXA1539P	CORRELATION
Q1	2SA812	BUFFER
2	2SC1623	BUFFER
3	2SA1226	AMP
4	2SC2757	AMP
5	2SC1623	AMP
6	2SC1623	Y DELAY
7	2SA1226	Y DELAY
8	2SA812	Y DELAY
9	2SA1226	Y/C MIX
10	2SC2757	Y/C MIX
11	2SC1623	Y AMP & BUFFER
12	2SA1226	Y AMP & BUFFER
13	2SC2757	Y AMP & BUFFER
14	2SC2757	Y DELAY
15	2SA812	Y DELAY
16	2SC3624A	BUFFER & SW
17	2SC1623	BPF 140 nsec(NTSC)110 nsec(PAL
18	2SA812	BPF 140 nsec(NTSC)110 nsec(PAL
19	2SC1623	BPF 140 nsec(NTSC)110 nsec(PAL
20	2SC2757	S COMB C LEVEL,PHASE
21	2SC1623	S COMB C LEVEL,PHASE
22	2SC1623	BPF,BUFFER
23	2SC1623	BPF,BUFFER
24	2SA812	BPF,BUFFER
25	2SC3624A	BUFFER & SW
32	2SC1623	1H DELAY(NTSC)2H DELAY(PAL)
33	2SC1623	1H DELAY(NTSC)2H DELAY(PAL)
34	2SA812	1H DELAY(NTSC)2H DELAY(PAL)
35	2SA812	1H DELAY(NTSC)2H DELAY(PAL)
36	2SA1226	1H DELAY(NTSC)2H DELAY(PAL)
37	2SC1623	AMP
38	2SA1226	AMP
39	2SC2757	AMP
40	2SC1623	AMP
41	2SC1623	BPF 140 ns DELAY(NTSC)110 ns D
42	2SA812	BPF 140 ns DELAY(NTSC)110 ns D
43	2SC1623	BPF 140 ns DELAY(NTSC)110 ns D
44	2SC1623	BPF 140 ns DELAY(NTSC)110 ns D
45	2SC1623	BPF 140 ns DELAY(NTSC)110 ns D
52	2SC1623	1H DELAY(NTSC)2H DELAY(PAL)
54	2SA812	1H DELAY(NTSC)2H DELAY(PAL)
56	2SA1226	1H DELAY(NTSC)2H DELAY(PAL)
57	2SC1623	AMP
58	2SA1226	AMP
59	2SC2757	AMP

* ▨▨▨ : Pattern from the side which enables seeing.
* ▨▨▨ : Pattern of the rear side.

5-21
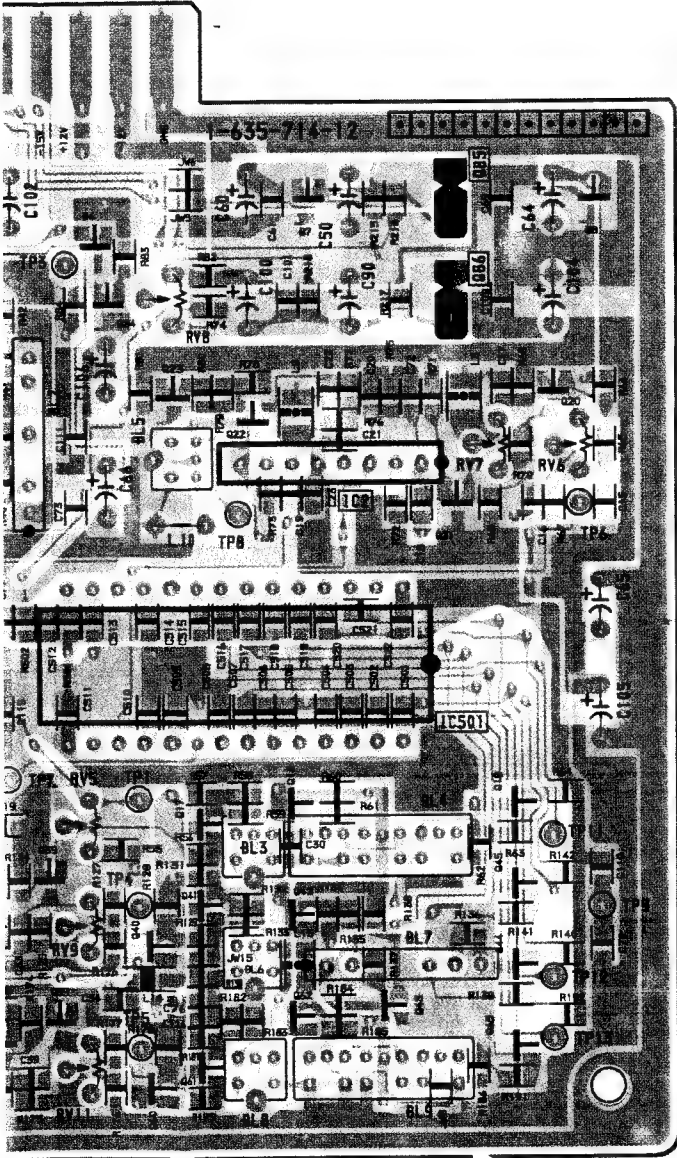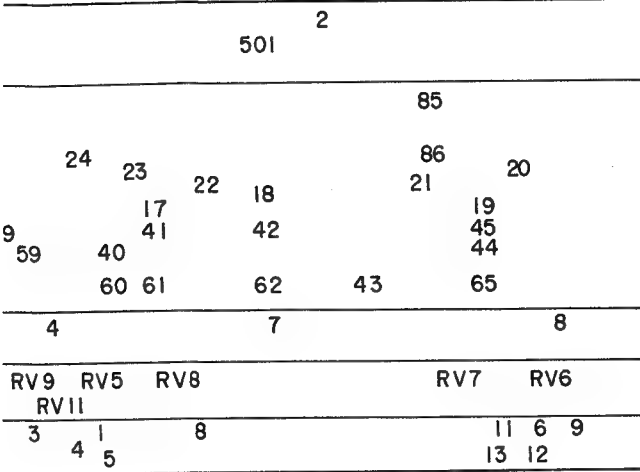
BT BOARD

IC1	LA7816	Y SELECT		Q60	2SC1623	AMP
2	LA7816	C SELECT		61	2SC1623	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)
3	NJM7809FA	9V REG		62	2SA812	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)
4	NJM7805FA	5V REG		65	2SC1623	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)
331	CXL1009P	CCD		71	2SC2757	X'TAL OSC
341	CXL1009P	CCD		72	2SA1226	X'TAL OSC
361	CXL1009P	CCD		73	2SC2757	X'TAL OSC
501	CXA1539P	CORRELATION		74	2SA1226	X'TAL OSC
				81	DTA144EK	SW CONTROL
Q1	2SA812	BUFFER		82	DTC144EK	SW CONTROL
2	2SC1623	BUFFER		83	DTA144EK	SW CONTROL
3	2SA1226	AMP		84	DTA144EK	SW CONTROL
4	2SC2757	AMP		85	2SB734	SW CONTROL
5	2SC1623	AMP		86	2SD774	SW CONTROL
6	2SC1623	Y DELAY				
7	2SA1226	Y DELAY		D1	1S2837	SW
8	2SA812	Y DELAY		2	RD5.6MB2	DC SHIFT
9	2SA1226	Y/C MIX		3	1S2837	SW
10	2SC2757	Y/C MIX		4	1S2837	SW
11	2SC1623	Y AMP & BUFFER		5	1S2837	SW CONTROL
12	2SA1226	Y AMP & BUFFER		6	1S2835	SW CONTROL
13	2SC2757	Y AMP & BUFFER		7	1S2837	SW CONTROL
14	2SC2757	Y DELAY		8	1S2835	SW CONTROL
15	2SA812	Y DELAY		9	1S2835	SW CONTROL
16	2SC3624A	BUFFER & SW		331	1S2837	CLAMP
17	2SC1623	BPF 140 nsec(NTSC)110 nsec(PAL)		341	1S2837	CLAMP
18	2SA812	BPF 140 nsec(NTSC)110 nsec(PAL)		361	1S2837	CLAMP
19	2SC1623	BPF 140 nsec(NTSC)110 nsec(PAL)				
20	2SC2757	S COMB C LEVEL, PHASE				
21	2SC1623	S COMB C LEVEL, PHASE				
22	2SC1623	BPF, BUFFER				
23	2SC1623	BPF, BUFFER				
24	2SA812	BPF, BUFFER				
25	2SC3624A	BUFFER & SW				
32	2SC1623	1H DELAY(NTSC)2H DELAY(PAL)				
33	2SC1623	1H DELAY(NTSC)2H DELAY(PAL)				
34	2SA812	1H DELAY(NTSC)2H DELAY(PAL)				
35	2SA812	1H DELAY(NTSC)2H DELAY(PAL)				
36	2SA1226	1H DELAY(NTSC)2H DELAY(PAL)				
37	2SC1623	AMP				
38	2SA1226	AMP				
39	2SC2757	AMP				
40	2SC1623	AMP				
41	2SC1623	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)				
42	2SA812	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)				
43	2SC1623	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)				
44	2SC1623	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)				
45	2SC1623	BPF 140 ns DELAY(NTSC)110 ns DELAY(PAL)				
52	2SC1623	1H DELAY(NTSC)2H DELAY(PAL)				
54	2SA812	1H DELAY(NTSC)2H DELAY(PAL)				
56	2SA1226	1H DELAY(NTSC)2H DELAY(PAL)				
57	2SC1623	AMP				
58	2SA1226	AMP				
59	2SC2757	AMP				
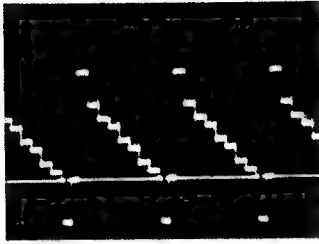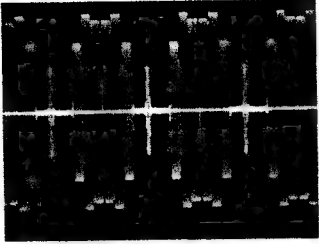
① 1.1 Vp-p(H)   ② 0.95 Vp-p(H)   ③ 0.58 Vp-p(H)
                                    ④ 1.9 Vp-p(H)

- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

BT board (3 LINE DYNAMIC COMB FILTER, 2 LINE SIMPLE COMB FILTER, BPF)
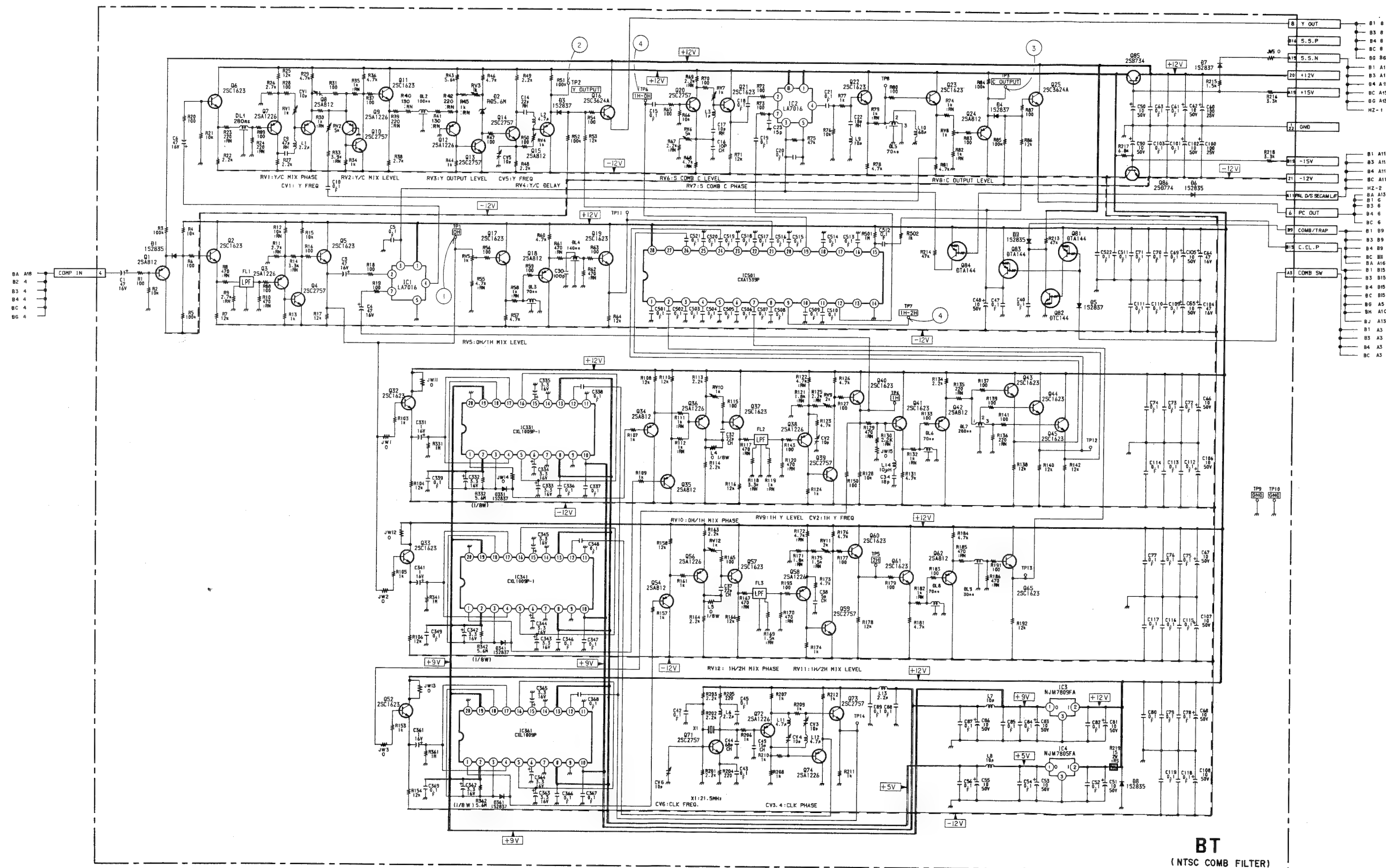
(BVM-1911 ONLY)

BT
(NTSC COMB FILTER)

BC Board (NTSC DECODER Y. TRAP)
(BVM-1911 ONLY)

IC									1							2		3	
Q		19 20 21	16 17 18							12 11				7	6 5	8		4	3 2 1
			104 101	103		15		14	13		10 9								
D		6	5		3		7				2								1 4
TP ADJ		RV5 TP5	RV4 TP3		TP2					TP7 TP6		CV2	RV3	RV2 CV1		TP4		TP1	RV1

1-617-873-14

SONY

Bc
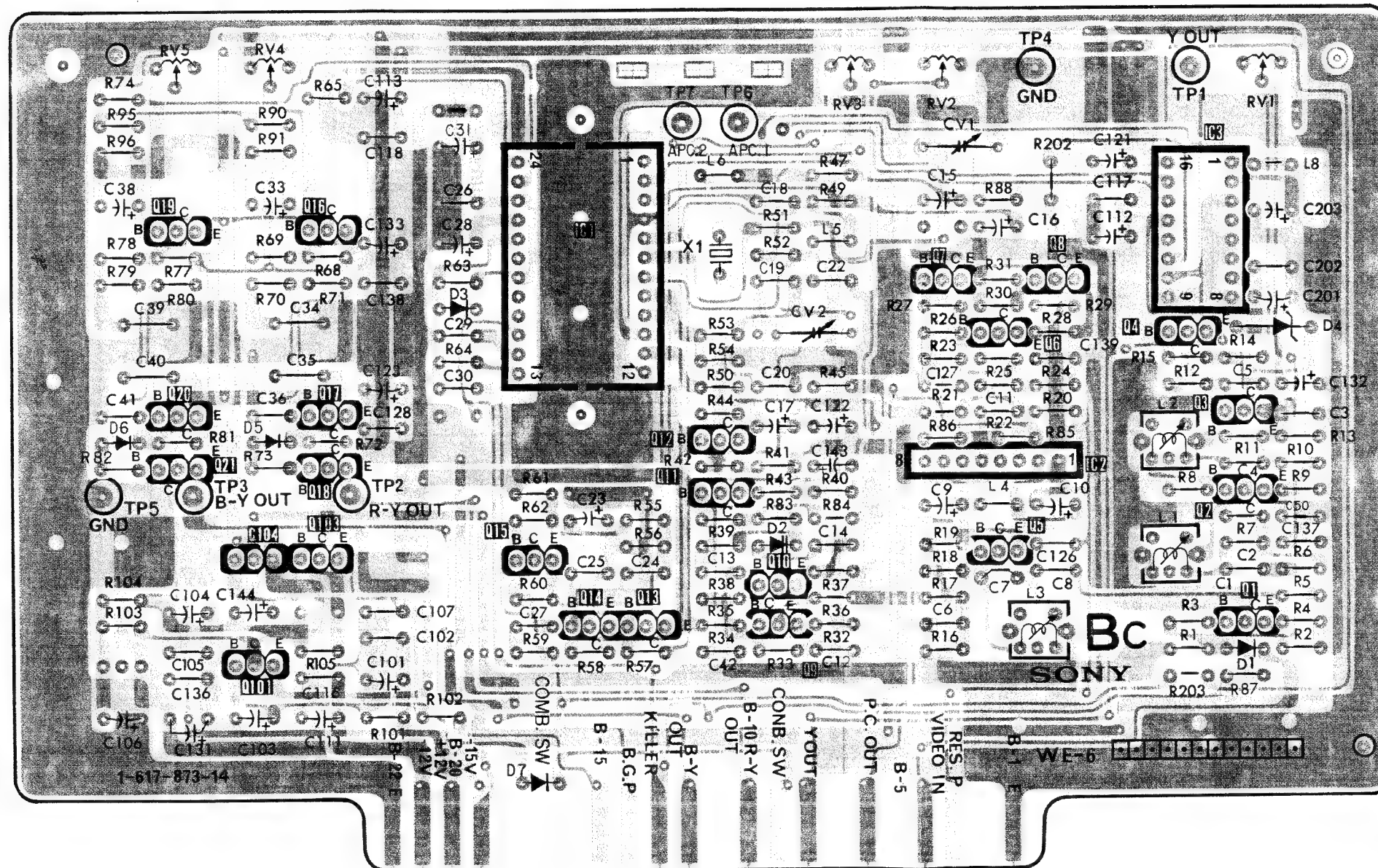
• : Pattern from the side which enables seeing.
• : Pattern of the rear side.

BC Board (NTSC DECODER Y. TRAP)
(BVM-1911 ONLY)

Bc (NTSC DECODER)
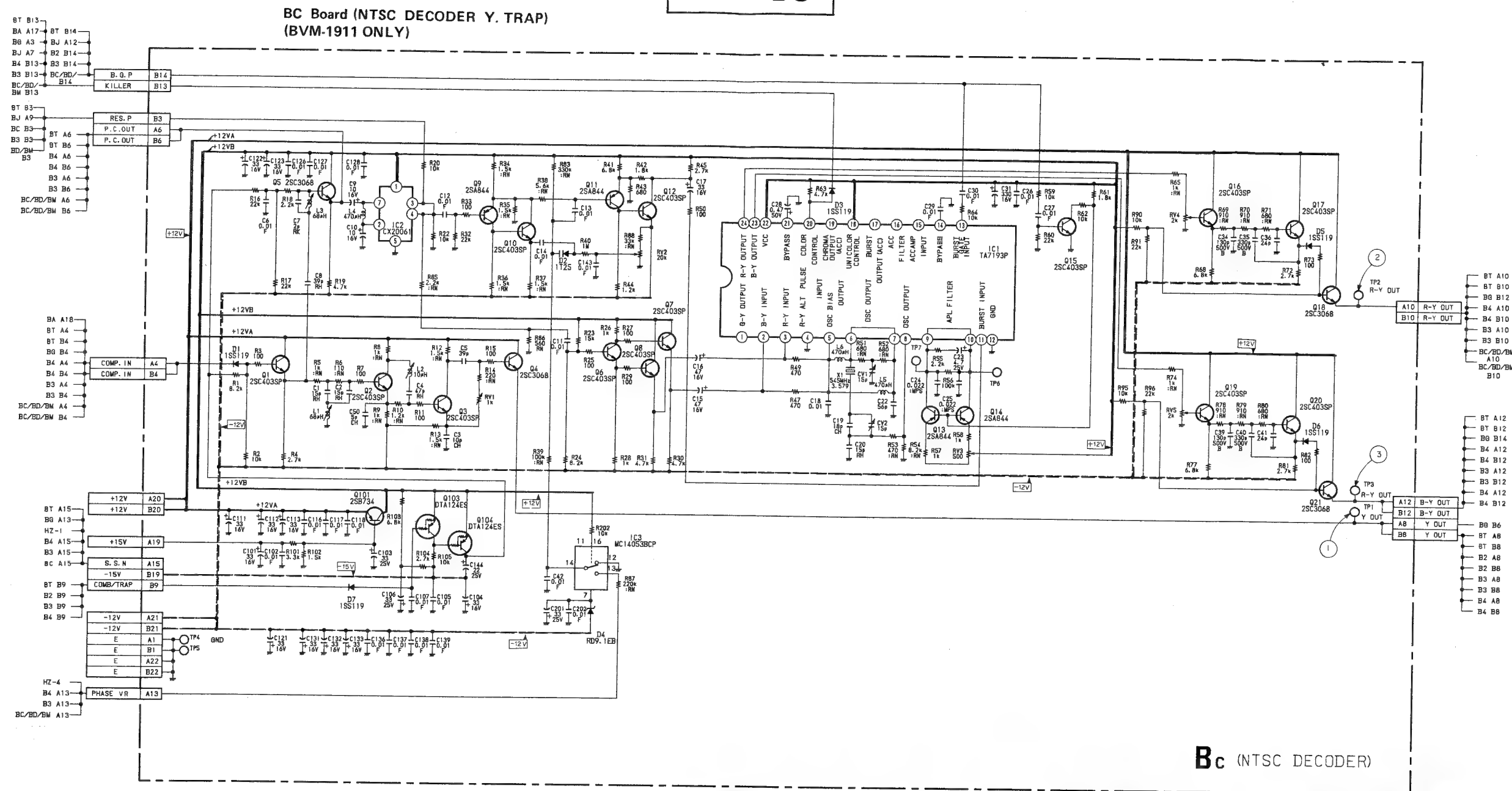
BC BOARD

IC1	TA7193P	DEMODULATOR
2	CX20061	RESIDUAL SWITCH
3	MC14053BCP	ANALOG SWITCH
Q1	2SC403SP	BUFF.
2	2SC403SP	ACTIVE FILTER
3	2SC403SP	Y-DELAY CORRECT
4	2SC3068	BUFF.
5	2SC3068	BUFF.
6	2SC403SP	AMP.
7	2SC403SP	BUFF.
8	2SC403SP	BUFF.
9	2SA844	PHASE CONTROL
10	2SC403SP	PHASE CONTROL
11	2SA844	PHASE CONTROL
12	2SC403SP	PHASE CONTROL
13	2SA844	APL FILTER

14	2SA844	APL FILTER
15	2SC403SP	APL FILTER
16	2SC403SP	LOW PASS FILTER
17	2SC403SP	LOW PASS FILTER
18	2SC3068	BUFF.
19	2SC403SP	LOW PASS FILTER
20	2SC403SP	LOW PASS FILTER
21	2SC3068	BUFF.
101	2SB734	SYSTEM SW.
103	DTA124ES	COMB. SWITCH
104	DTA124ES	COMB. SWITCH
D1	1SS119	SYSTEM SWITCH
2	1T25	PHASE CONTROL
3	1SS119	KILLER SWITCH
4	RD9.1EB3	SWITCH BIAS.
5	1SS119	SYSTEM SWITCH
6	1SS119	SYSTEM SWITCH
7	1SS119	PROTECTOR

① 1Vp-p (H)

② 0.3Vp-p (H)

③ 0.36 Vp-p (H)

Bc (NTSC DECODER)

① 1Vp-p (H)

② 0.3Vp-p (H)

③ 0.36 Vp-p (H)

5. DIAGRAMS

BD board (PAL DECODER Y.TRAP)
(BVM-2011P ONLY)

① 1Vp-p (H)

② 0.3Vp-p   ④ 0.32Vp-p
③ 0.32Vp-p   ⑤ 0.36Vp-p

⑥ 0.38Vp-p   ⑧ 0.39Vp-p
⑦ 0.38Vp-p   ⑨ 0.42Vp-p

⑩ 0.26Vp-p (H)
⑪ 0.26Vp-p (H)

5. DIAGRAMS
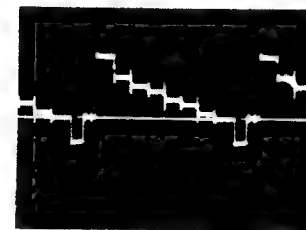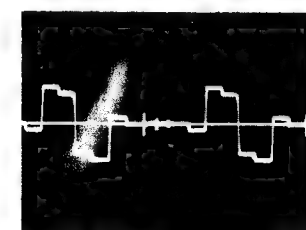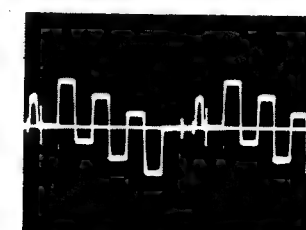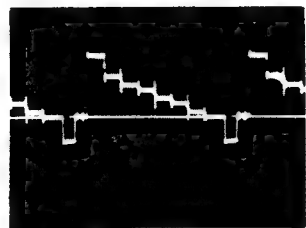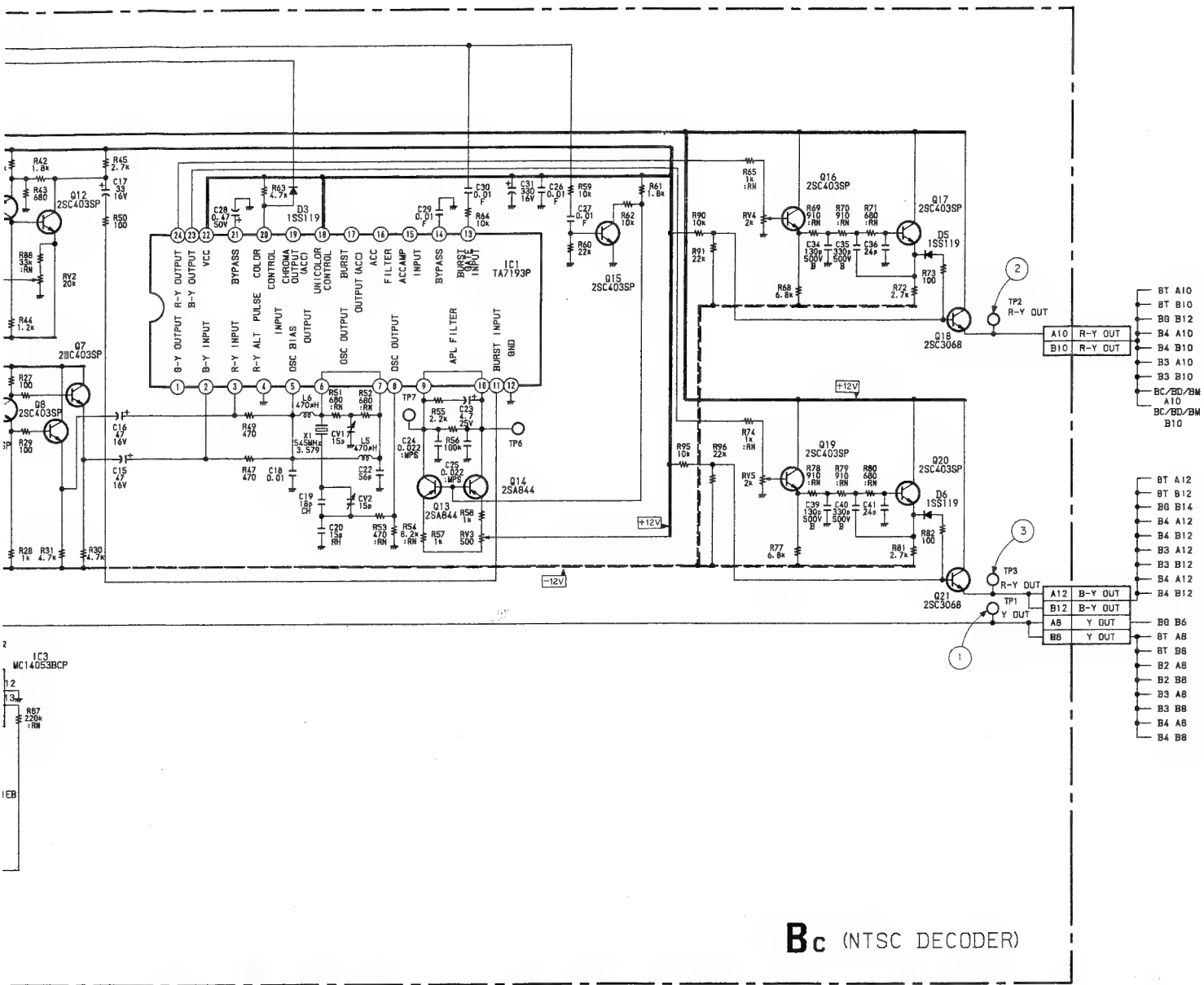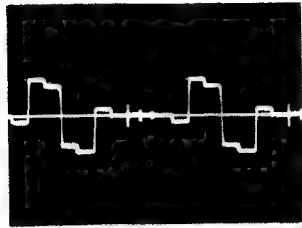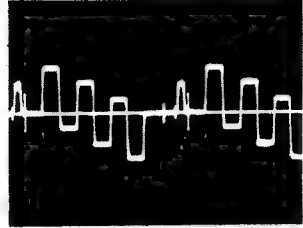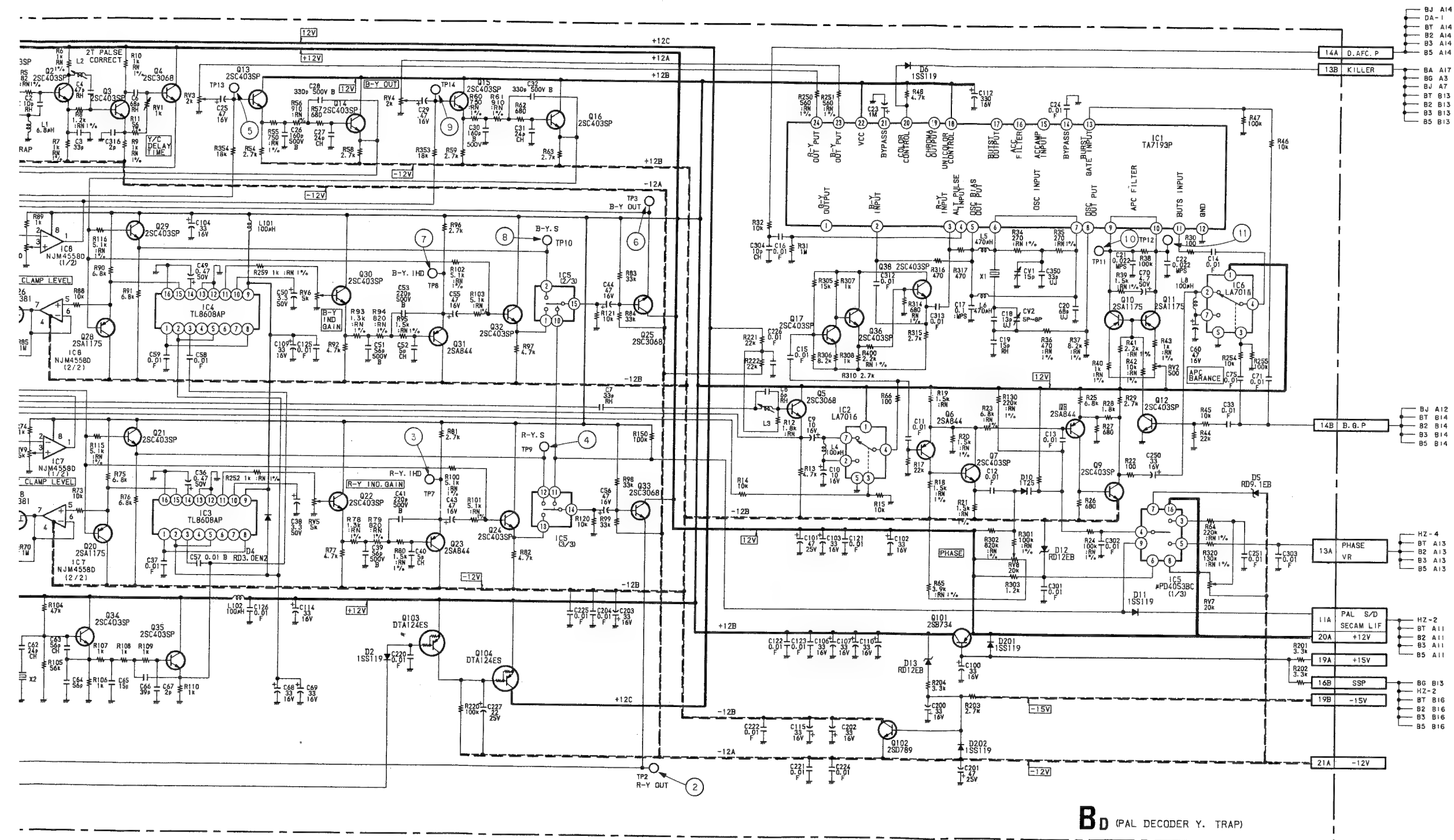
$\mathbf{B}_D$ (PAL DECODER Y. TRAP)

BD board (PAL DECODER Y. TRAP)
(BVM-2011P ONLY)

IC	5	4	3	7 8		1 2	6
Q		34	35	21 20 18 14 13			10 11 12 38
	33 25	32 31	30 24 23	22 29 28 26 16 15			9 8 7 6
	101	102 104 103		4 3 2 1 5	36,17		
D	15 12 11 5 13	4				6	
		201	202	2	1		10
ADJ . TP	RV7 TP5		TP9		CV1 RV4 RV3 TP13 TP14		RV2 CV2 RV8
		RV6	TP7 RV5 RV9				TP11 TP12
	TP8	TP10	TP6 TP3 TP2 TP1 RV10 RV1				
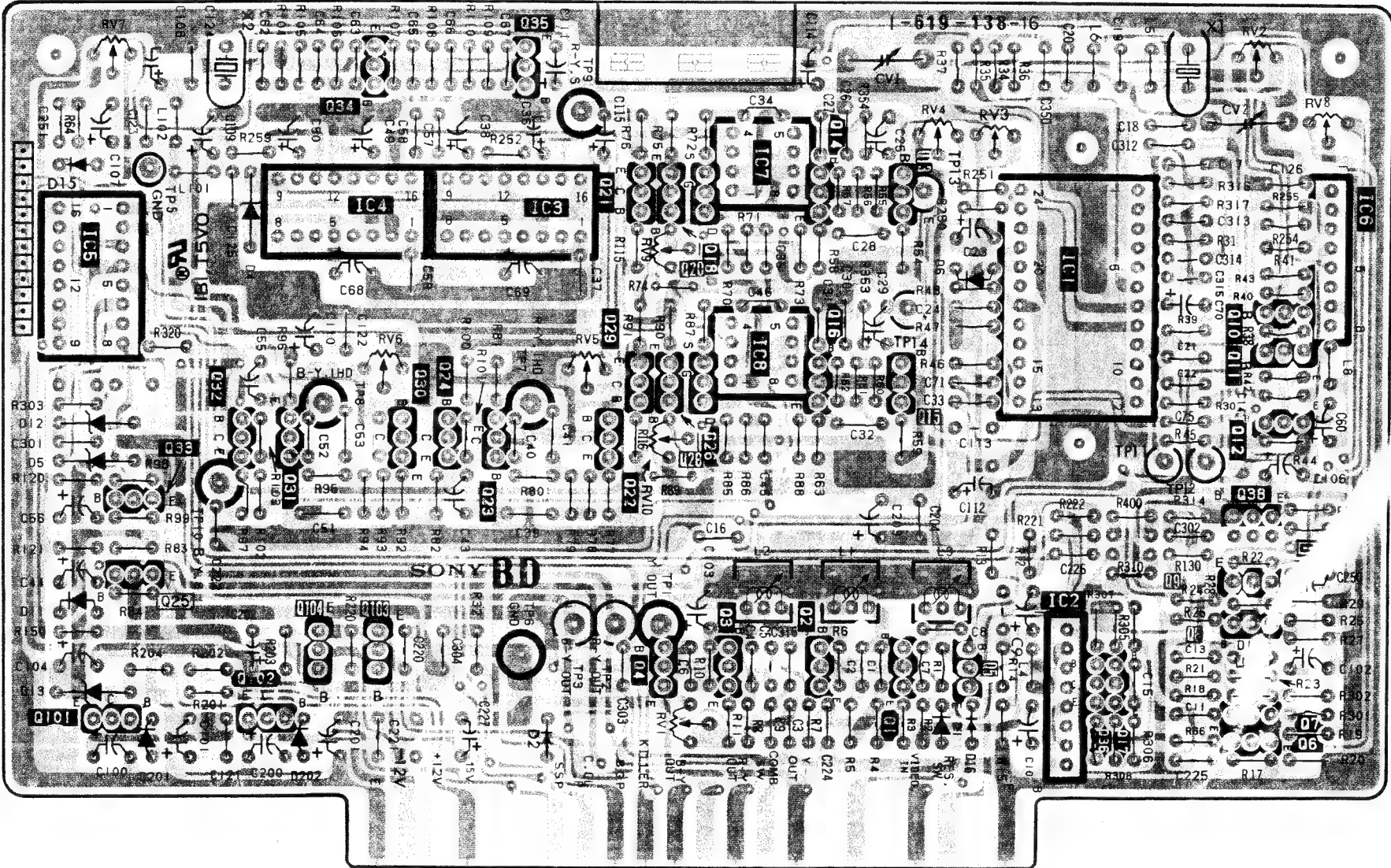
BD BOARD

IC1	TA7193P	PAL DEMODULATOR
2	LA7016	RESIDUAL SWITCH
3	TL8608P	1H DELAY LINE
4	TL8608P	1H DELAY LINE
5	MC14053BCP	ANALOG SWITCHER
6	LA7016	BURST GATE
7	NJM4558P	R-Y CLAMP
8	NJM4558P	B-Y CLAMP
Q1	2SC403SP	BUFFER
2	2SC403SP	ACTIVE FILTER
3	2SC403SP	Y-DELAY CORRECTER
4	2SC3068	BUFFER
5	2SC3068	BUFFER
6	2SA844	PHASE CONTROLLER
7	2SC403SP	PHASE CONTROLLER
8	NJM4558P	PHASE CONT. AMP.
9	NJM4558P	PHASE CONT. AMP.
10	2SA1175	APL FILTER
11	2SA1175	APL FILTER
12	2SC403SP	APL FILTER SWITCH
13	2SC403SP	R-Y L.P.F
14	2SC403SP	R-Y L.P.F
15	2SC403SP	B-Y L.P.F
16	2SC403SP	B-Y L.P.F
17	2SC403SP	AMPLIFIER
18	2SK381	R-Y CLAMP
20	2SA1175	BUFFER
21	2SC403SP	BUFFER
22	2SC403SP	CCD OUT L.P.F
23	2SA844	CCD OUT L.P.F
24	2SC403SP	BUFFER
25	2SC3068	BUFFER
26	2SK381	B-Y CLAMP
28	2SA1175	BUFFER
29	2SC403SP	BUFFER
30	2SC403SP	CCD OUT L.P.F
31	2SA844	CCD OUT L.P.F
32	2SC403SP	BUFFER
33	2SC3068	BUFFER
34	2SC403SP	CCD CLOCK GEN
35	2SC403SP	CCD CLOCK GEN
36	2SC403SP	BUFFER
38	2SC403SP	BUFFER
101	2SB734	SYSTEM SWITCH
102	2SD789	SYSTEM SWITCH
103	DTA124ES	COMB. SWITCH
104	DTA124ES	COMB. SWITCH
D1	1SS119	SYSTEM SWITCH
2	1SS119	COMB. SWITCH
4	RD3.0EB1	CCD BIAS
5	RD9.1EB2	SWITCH BIAS
6	1SS119	KILLER SWITCH
10	1T25	PHASE CONTROL
11	1SS119	PAL S/D SWITCH
12	RD12EB2	PHASE SWITCH
13	RD12EB2	SYSTEM SWITCH
16	1SS119	COMB SW
201	1SS119	PROTECTOR
202	1SS119	PROTECTOR

∎ : Pattern from the side which enables seeing.

∎ : Pattern of the rear side.

BG board (COLOR GAIN CONTROL, COMPONENT R-Y AMP & DELAY, APERTURE CONTROL, Y DELAY, VECTOR OUT, NTSC MATRIX SW, G-Y MATRIX AMP)

5-35

5-36

: Pattern from the side which enables seeing.

: Pattern of the rear side.

BG board (COLOR GAIN CONTROL, COMPONENT R-Y AMP & DELAY, APERUTURE CONTROL, Y DERAY, VECTOR OUT NTSC MATRIX SW, G-Y MATRIX AMP)

BG (COLOR GAIN CONTROL)
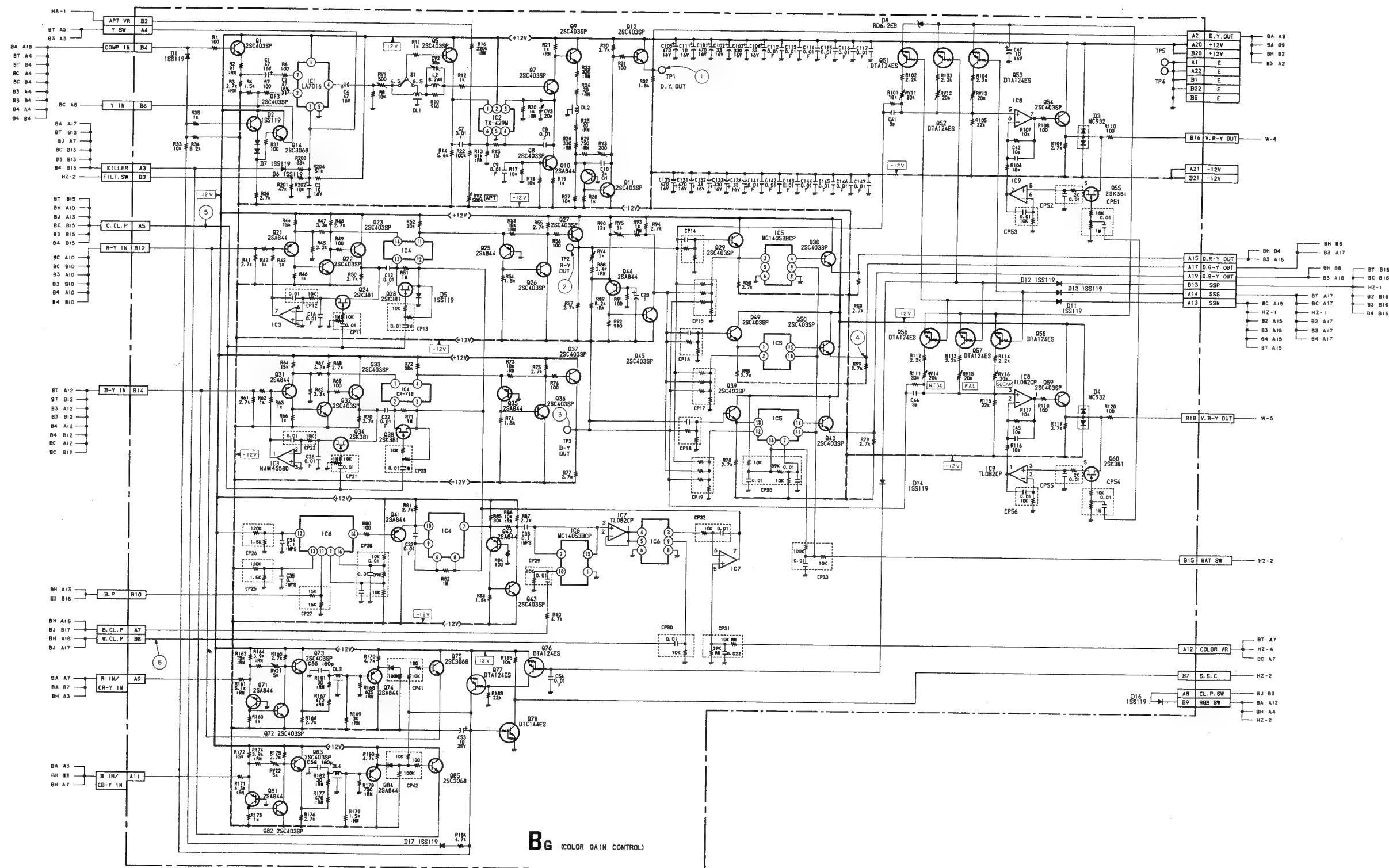
BG BOARD
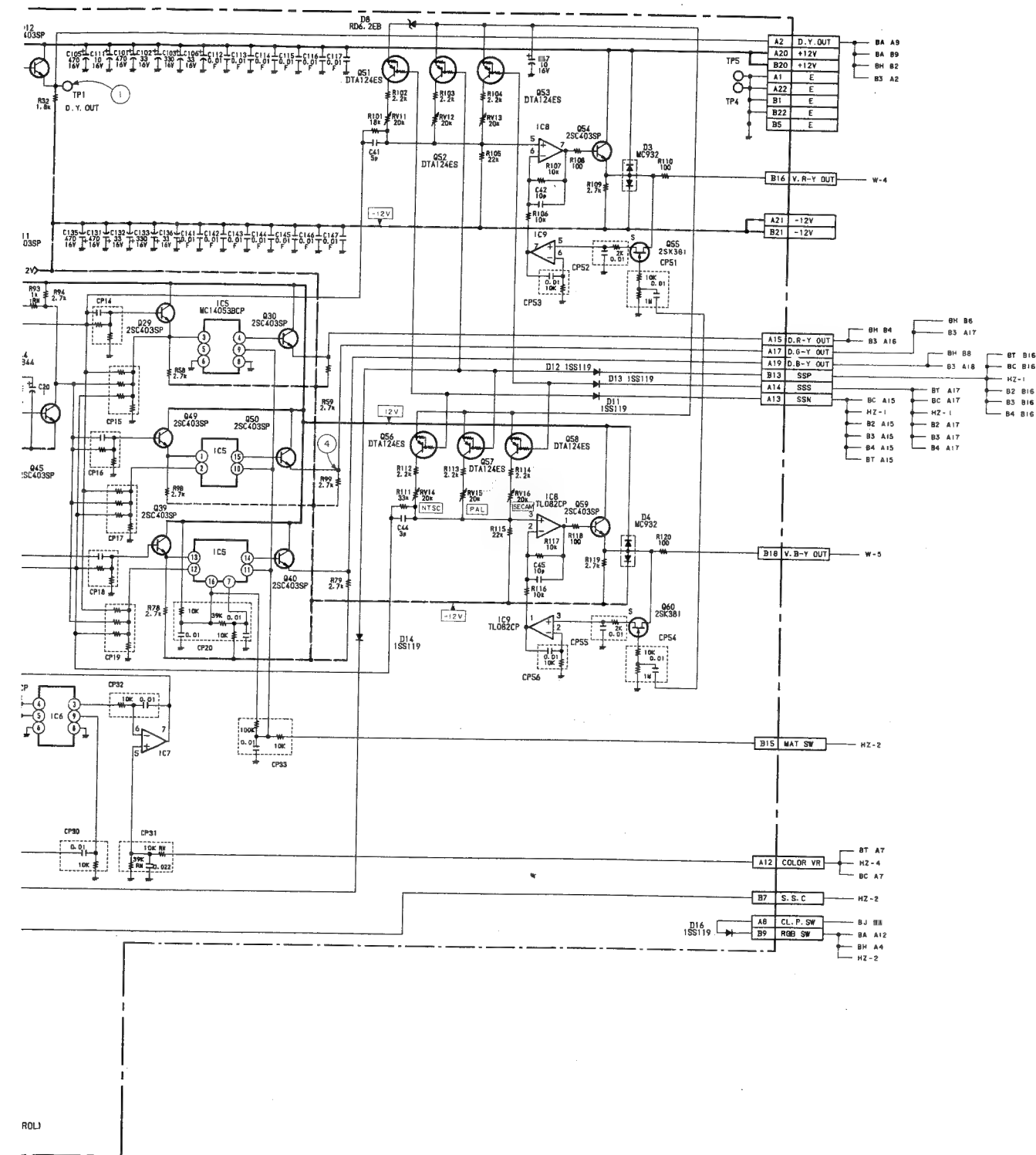
IC1	LA7016	FILTER SW
2	TX-429M	APERTURE
3	NJM4558D	COLOR DIFFERENCE CLAMP
4	CX-718D	CHROMA CONTROL
5	MC14053BCP	MATRIX SW
6	MC14053BCP	CHROMA CONTROL
7	TL082CP	CHROMA CONTROL
8	TL082CP	VECTOR OUTPUT
9	TL082CP	VECTOR OUTPUT
Q1	2SC403SP	BUFF
5	2SC403SP	APERTURE
7	2SC403SP	APERTURE
8	2SC403SP	APERTURE
9	2SC403SP	Y DELAY
10	2SA844	Y AMP
11	2SC403SP	Y AMP
12	2SC403SP	Y AMP
13	2SC403SP	BUFF
14	2SC3068	BUFF
21	2SA844	R-Y AMP
22	2SC403SP	R-Y AMP
23	2SC403SP	R-Y CLAMP
24	2SK381	R-Y CLAMP
25	2SA844	R-Y CHROMA CONTROL
26	2SC403SP	R-Y CHROMA CONTROL
27	2SC403SP	R-Y CHROMA CONTROL
28	2SK381	R-Y CHROMA CONTROL
29	2SC403SP	R-Y BUFF
30	2SC403SP	R-Y BUFF
31	2SA844	B-Y AMP
32	2SC403SP	B-Y AMP
33	2SC403SP	B-Y CLAMP
34	2SK381	B-Y CLAMP
35	2SA844	B-Y CHROMA CONTROL
36	2SC403SP	B-Y CHROMA CONTROL
37	2SC403SP	B-Y CHROMA CONTROL
38	2SK381	B-Y CHROMA CONTROL
39	2SC403SP	B-Y BUFF
40	2SC403SP	B-Y BUFF
41	2SA844	CHROMA CONTROL
42	2SA844	CHROMA CONTROL
43	2SC403SP	CHROMA CONTROL

Q44	2SA844	CHROMA CONTROL
45	2SC403SP	CHROMA CONTROL
49	2SC403SP	G-Y BUFF
50	2SC403SP	G-Y BUFF
51	DTA124ES	GAIN CHANGE SW
52	DTA124ES	GAIN CHANGE SW
53	DTA124ES	GAIN CHANGE SW
54	2SC403SP	R-Y BUFF
55	2SK381	R-Y CLAMP
56	DTA124ES	GAIN CHANGE SW
57	DTA124ES	GAIN CHANGE SW
58	DTA124ES	GAIN CHANGE SW
59	2SC403SP	B-Y BUFF
60	2SK381	B-Y CLAMP
71	2SA844	R-Y AMP
72	2SC403SP	R-Y AMP
73	2SC403SP	R-Y AMP
74	2SA844	R-Y DELAY
75	2SC3068	R-Y BUFF
76	DTA124ES	COMPONENT SW
77	DTA124ES	COMPONENT SW
78	DTC144ES	COMPONENT SW
81	2SA844	B-Y AMP
82	2SC403SP	B-Y AMP
83	2SC403SP	B-Y AMP
84	2SA844	B-Y DELAY
85	2SC3068	B-Y BUFF
D1	1SS119	COMPONENT SW
2	1SS119	DC SHIFT SW
3	MC932	PROTECT
4	MC932	PROTECT
5	1SS119	PROTECT
6	1SS119	DC SHIFT
7	1SS119	FILTER SW
8	RD6.2E-B2	+6V REG
11	1SS119	GAIN CHANGE SW
12	1SS119	GAIN CHANGE SW
13	1SS119	GAIN CHANGE SW
14	1SS119	GAIN CHANGE SW
16	1SS119	R.G.B. SW
17	1SS119	KILLER
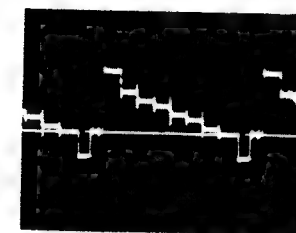
① 1.0Vp-p (H)
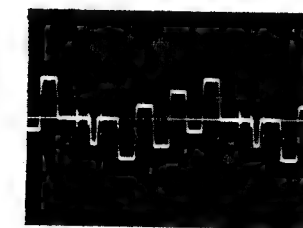
③ 1.7Vp-p (H)
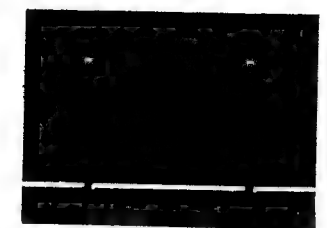
⑤ 4.8Vp-p (H)

② 1.4Vp-p (H)

⑥ 12Vp-p (H)

5. DIAGRAMS

BH BOARD

5. DIAGRAMS
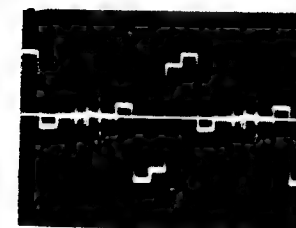
IC1(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP & CROSS HATCH SW
(3/3)		SCREENING SW
2(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP SW
(3/3)		SCREENING SW
3(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP SW
(3/3)		SCREENING SW
4(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP SW
(3/3)		SCREENING SW
5	NJM4558S	SAMPLE HOLD
6	NJM4558S	SAMPLE HOLD
7	LA7016	BLUE ONLY SW
8	LA7016	BLUE ONLY SW
9	MC14053BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
10(1/2)	MC14053BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
(2/2)		COLOR DIFFERENCE & R.G.B. SCREENING PULSE GEN
11(1/4)	MC14081BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
(3/4)		
(2/4)		COLOR DIFFERENCE & R.G.B. SCREENING PULSE GEN
(4/4)		Y SCREENING PULSE GEN
12	MC14081BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
13	MC14001BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
14	TC4030BP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
101	TX-429M	R CONTRAST CONTROL
102	TL082CP	R CONTRAST & BRIGHT CONTROL
201	TX-429M	G CONTRAST CONTROL
202	TL082CP	G CONTRAST & BRIGHT CONTROL
301	TX-429M	B CONTRAST CONTROL
302	TL082CP	B CONTRAST & BRIGHT CONTROL
Q1	2SC403SP	Y BUFF
2	2SK523	Y SAMPLE HOLD
3	2SA844	Y BUFF
4	2SC403SP	R-Y/R BUFF

Q5	2SK523	R-Y/Y SAMPLE HOLD
6	2SA844	R-Y/R BUFF
7	2SC403SP	G-Y/R BUFF
8	2SK523	G-Y/R SAMPLE HOLD
9	2SA844	G-Y/G BUFF
10	2SC403SP	B-Y/B BUFF
11	2SK523	B-Y/B SAMPLE HOLD
12	2SA844	B-Y/B BUFF
13	2SA844	R BUFF
14	2SA844	G BUFF
15	2SA844	B BUFF
16	2SC3068	AGC PULSE BUFF
101	2SK381	R CONTRAST CONTROL
102	2SA844	R AMP
103	2SC403SP	R AMP
104	2SC403SP	R LIMITER
105	2SC403SP	R LIMITER
106	2SK381	R BRIGHT CONTROL
107	2SK381	R CONTRAST CONTROL
108	2SK381	R CONTRAST CONTROL
201	2SK381	G CONTRAST CONTROL
202	2SA844	G AMP
203	2SC403SP	G AMP
204	2SC403SP	G LIMITER
205	2SC403SP	G LIMITER
206	2SK381	G BRIGHT CONTROL
207	2SK381	G CONTRAST CONTROL
208	2SK381	G CONTRAST CONTROL
301	2SK381	B CONTRAST CONTROL
302	2SA844	B AMP
303	2SC403SP	B AMP
304	2SC403SP	B LIMITER
305	2SC403SP	B LIMITER
306	2SK381	B BRIGHT CONTROL
307	2SK381	B CONTRAST CONTROL
308	2SK381	B CONTRAST CONTROL
D1	1SS119	
101	1SS119	R LIMITER
102	1SS119	R PROTECT
201	1SS119	G LIMITER
202	1SS119	G PROTECT
301	1SS119	B LIMITER
302	1SS119	B PROTECT
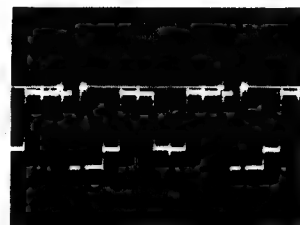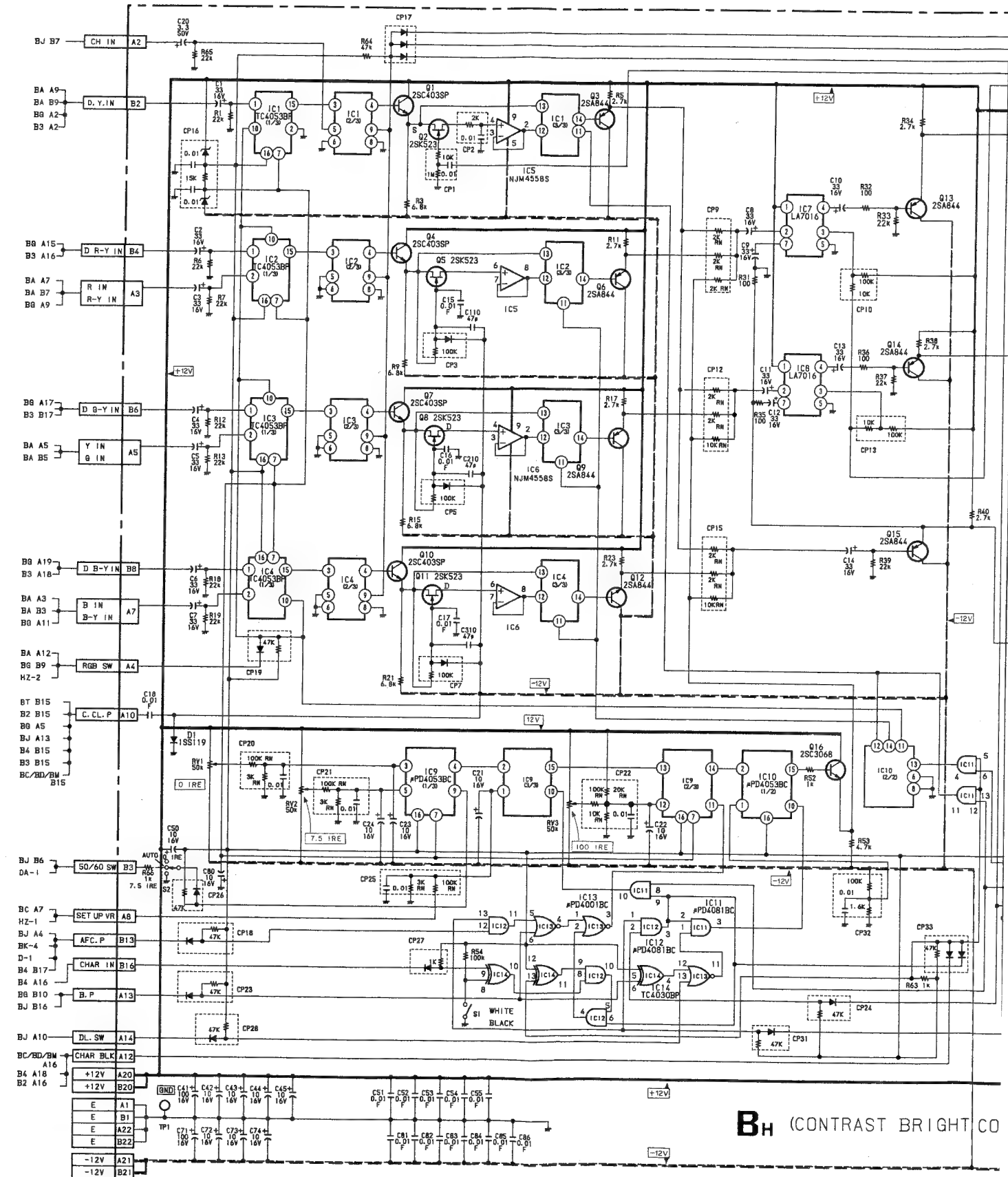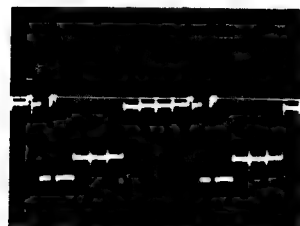
① 0.8Vp-p (H)

② 0.8Vp-p (H)

③ 0.7Vp-p (H)

BH board (Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y-C MATRIX, CONTRAST/BRIGHTNESS CONTROL)

BH (CONTRAST BRIGHT CO

BH board (Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y-C MATRIX, CONTRAST/BRIGHTNESS CONTROL)

B_H (CONTRAST BRIGHT CONTROL)

BH board (Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y-C MATRIX, CONTRAST/BRIGHTNESS CONTROL)

IC		9 4 3 2 1	10 6 5	11 8 7	12 301 201 101	13	14				102 202 302
Q	10 7 4 1		12 11 8 9 6 5 2 3	16	15 14 13	301 201	302 202	303 203	304 305 204 205	306 307 308 206 207 208 106	108
						101	102	103	104 105	107	108
D				1		302 202 102	301 201 101				
TP ADJ		RV1 RV2 RV3				TP1				TP201 TP101 TP301	

1-017-075-10

SONY WE-6

BH

- ▬▬▬ : Pattern from the side which enables seeing.
- ▬▬▬ : Pattern of the rear side.

BI board (DRIVE CONTROL, BEAM CURRENT CONTROL)

IC											
	101	105	201	205	301	305					
	102	103	104	202	203	204	302	303	304		
Q		114		214 14 13 12 11			314				15
	108	113	208	213	308	313					
	107		207		307						
	102 103 106	202 203 206	209	302 303 301	306	309	3 2					
	101 105 110	201 205 210	305 310									
D	7	2 6									
	4 1 102	204 202	302								
	5 104 103	203	304 303	8							
	101 105	201 205	301 305								
TP			TP 1								

SONY BI
1-617-876-16

- ☐ : Pattern from the side which enables seeing.
- ▓ : Pattern of the rear side.

BI board (DRIVE CONTROL, BEAM CURRENT CONTROL)

BI BOARD

IC1	NJM4558D	ABL
101(1/3)		SCREEN OFF SW
(2/3)	TC4053BP	AGC PULSE GEN
(3/3)		AGC PULSE INSERT
102	TX-429M	GAIN CONTROL
103(1/2)	TL082CP	GAIN CONTROL
(2/2)		BIAS CONTROL
104	TL082CP	AMP
105(1/2)	TL082CP	I-V CONVERTER
(2/2)		CURRENT FEEDBACK CONTROL
201(1/3)		SCREEN OFF SW
(2/3)	TC4053BP	AGC PULSE GEN
(3/3)		AGC PULSE INSERT
202	TX-429M	GAIN CONTROL
203(1/2)	TL082CP	GAIN CONTROL
(2/2)		BIAS CONTROL
204	TL082CP	AMP
205(1/2)	TL082CP	I-V CONVERTER
(2/2)		CURRENT FEEDBACK CONTROL
301(1/3)		SCREEN OFF SW
(2/3)	TC4053BP	AGC PULSE GEN
(3/3)		AGC PULSE INSERT
302	TX-429M	GAIN CONTROL
303(1/2)	TL082CP	GAIN CONTROL
(2/2)		BIAS CONTROL
304	TL082CP	AMP
305(1/2)	TL082CP	I-V CONVERTER
(2/2)		CURRENT FEEDBACK CONTROL
Q1	DTC143TS	OVER LOAD LED DRIVE
2	2SC403SP	PULSE SHAPING
3	2SC403SP	PULSE SHAPING
11	2SC2878	G2 CONTROL
12	2SC2878	G2 CONTROL
13	2SC2878	G2 CONTROL
14	2SC2878	G2 CONTROL
15	DTA144ES	G2 CONTROL
101	2SA844	LIMITER
102	2SA844	LIMITER
103	2SA844	LIMITER
105	2SK381	GAIN CONTROL
106	2SA844	AMP
107	2SC2668	AMP
108	2SA844	AMP
109	2SK381	SAMPLE-HOLD

Q110	2SK381	SAMPLE-HOLD
113	2SK381	SAMPLING
114	2SA1091	CLAMP BIAS CONTROL
201	2SA844	LIMITER
202	2SA844	LIMITER
203	2SA844	LIMITER
205	2SK381	GAIN CONTROL
206	2SA844	AMP
207	2SC2668	AMP
208	2SA844	AMP
209	2SK381	SAMPLE-HOLD
210	2SK381	SAMPLE-HOLD
213	2SK381	SAMPLING
214	2SA1091	CLAMP BIAS CONTROL
301	2SA844	LIMITER
302	2SA844	LIMITER
303	2SA844	LIMITER
305	2SK381	GAIN CONTROL
306	2SA844	AMP
307	2SC2668	AMP
308	2SA844	AMP
309	2SK381	SAMPLE-HOLD
310	2SK381	SAMPLE-HOLD
313	2SK381	SAMPLING
314	2SA1091	CLAMP BIAS CONTROL
D1	1SS119	PROTECTOR
2	1SS119	PROTECTOR
4	1SS119	ABL
5	1SS119	ABL
6	RD12ESB2	OVER LOAD LED DRIVE
7	1SS119	ABL
8	1SS119	G2 CONTROL
101	1SS119	PROTECTOR
102	MC932	PROTECTOR
103	RD4.3ES-T1B	LIMITER
104	1SS119	LIMITER
D105	RD6.2ESB	LIMITER
201	1SS119	PROTECTOR
202	MC932	PROTECTOR
203	RD4.3ES-T1B	LIMITER
204	1SS119	LIMITER
D205	RD6.2ESB	LIMITER
301	1SS119	PROTECTOR
302	MC932	PROTECTOR
303	RD4.3ES-T1B	LIMITER
304	1SS119	LIMITER
D305	RD6.2ESB	LIMITER
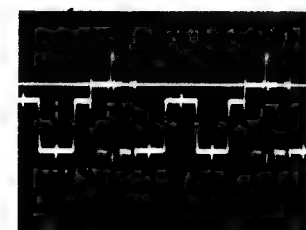
① 1.0Vp-p(H)

③ 1.0Vp-p(H)

② 1.0Vp-p(H)

5. DIAGRAMS

BJ BOARD
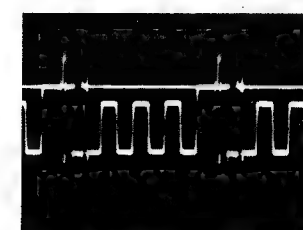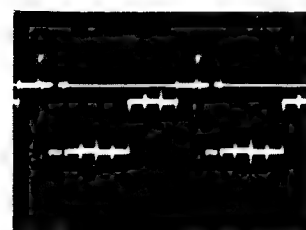
IC1	HD14538BP	PIC.SET.PULSE GEN
2	MC14001BCP	CROSS HATCH GEN
3	TC4040BP	V SYNC & DELAY
4	TC4040BP	V COUNT
5	TC504027BP	V SYNC & DELAY
6(1/2)	TC504027BP	CHROMA CLAMP PULSE GEN
(2/2)	TC504027BP	2fH MULTI
7	TC504027BP	V COUNT
8	TC504027BP	1H PULSE PROCESS
9(1/2)	TC504027BP	V SYNC & DELAY
(2/2)	TC50427BP	1H PULSE PROCESS
10(1/2)	HD14538BP	B.G.P GEN 2
(2/2)		H CYCLE
11(1/2)	HD14538BP	CROSS HATCH GEN
(2/2)		SPLIT Y BLK, C BLK PULSE GEN
12	HD14538BP	Y CYCLE AGC & CLAMP PULSE GEN
13(1/4)		CHROMA CLAMP PULSE GEN
(2/4)	MC14001BCP	Y.CL.P GEN
(3/4)		B.G.P GEN 2
(4/4)		RESIDUAL PULSE GEN
14(1/4)		SPLIT Y BLK: C BLK PULSE GEN
(3/4)	MC14001BCP	
(4/4)		
(2/4)		V CYCLY AGC & CLAMP PULSE GEN
15	MC14071BCP	V CYCLE AGC & CLAMP PULSE GEN
16(1/4)		CROSS HATCH GEN
(2/4)	MC14011BCP	Y CYCLE AGC & CLAMP PULSE GEN
(3/4)		H OR V BLK, P
(4/4)		SPLIT Y BLK, C BLK PULSE GEN
17	MC14011BCP	CROSS HATCH GEN
18	TC4023BP	CROSS HATCH GEN
19(1/4)		V COUNT
(2/4)	MC14081BCP	V SYNC & DELAY
(3/4)		2fH MULTI
(4/4)		1H PULSE PROCESS
20	MC14081BCP	V CYCLE AGC & CLAMP PULSE GEN
21(1/2)		
(2/4)	MC14071BCP	V SYNC & DELAY
(4/4)		V COUNT
22(1/4)		2fH MULTI
(2/4)	MC14071BCP	V COUNT
(3/4)		
(4/4)		V SYNC & DELAY

IC23(1/3)		V SYNC & DELAY
(2/3)	TC4073BP	
(3/3)		V COUNT
24(1/5)		V SYNC & DELAY
(4/5)		
(2/5)	MC14069UBCP	CROSS HATCH GEN
(3/5)		
(5/5)		V COUNT
25(1/6)		1H PULSE PROCESS
(2/6)		INV
(3/6)	MC14069UBCP	H OR V BLK.P
(4/6)		Y CYCLE AGC & CLAMP PULSE GEN
(5/6)		
(6/6)		CROSS HATCH GEN
26	MC14175BCP	1H PULSE PROCESS
27(1/3)		CLAMP PULSE CHANGE SW
(2/3)	MC14053BCP	CROSS HATCH GEN
(3/3)		H OR V DL SW
28	TC4520BP	CROSS HATCH GEN
29(1/2)	HD14538BP	B.G.P GEN 1
(2/2)		Y.CL.P GEN
Q14	2SC2785	CROSS HATCH GEN
15	2SC2785	Y.CL.P GEN
16	2SC2785	Y.CL.P GEN
17	2SC2785	CHROMA CLAMP PULSE GEN
18	2SC2785	CHROMA CLAMP PULSE GEN
19	2SA1115	H CYCLE
20	2SC2785	H CYCLE
21	2SC2785	H CYCLE
22	2SC2785	H CYCLE
23	2SA1048	H CYCLE
24	2SC2785	H CYCLE
25	2SC2785	CHROMA CLAMP PULSE GEN
26	2SC2785	Y.CL.P GEN
D1	1SS119	CROSS HATCH GEN
2	1SS119	H CYCLE
3	1SS119	H CYCLE
7	1SS119	1H PULSE PROCESS
8	1SS119	V SYNC & DELAY
9	1SS119	2fH MULTI
11	MC932	PROT

5. DIAGRAMS

① 12Vp-p (H)

② 12Vp-p (H)

③ 12Vp-p (V)

④ 12Vp-p (H)

⑤ 12Vp-p (H)
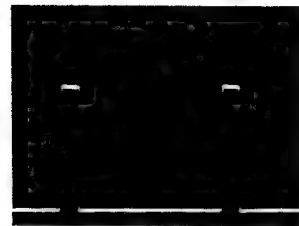
⑥ 12Vp-p (H)

BJ board (SYNC PROCESSING & PULSE GEN)

B$_J$

(SYNC PRO & PULSE GEN)

BJ board (SYNC PROCESSING & PULSE GEN)

BJ
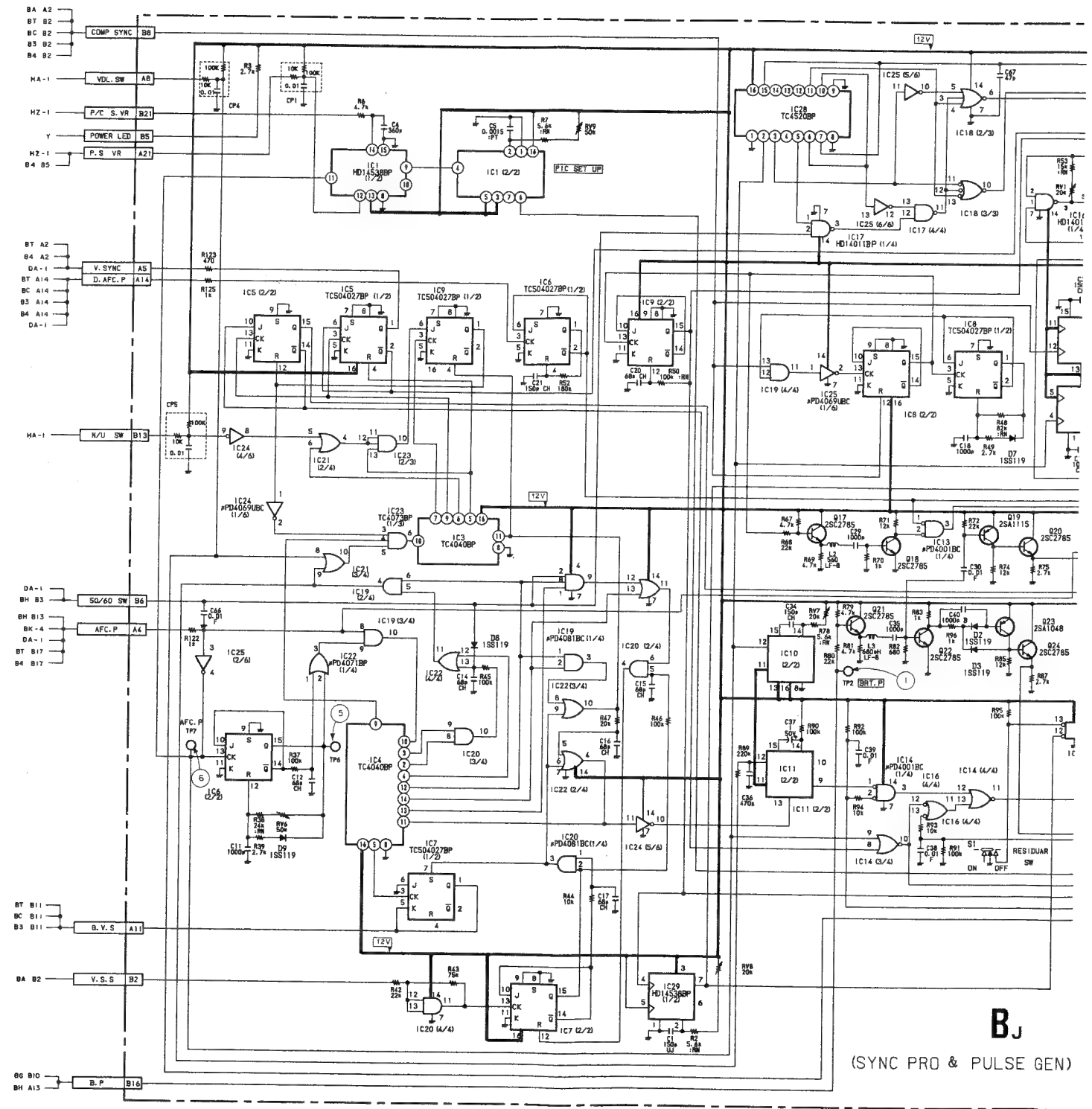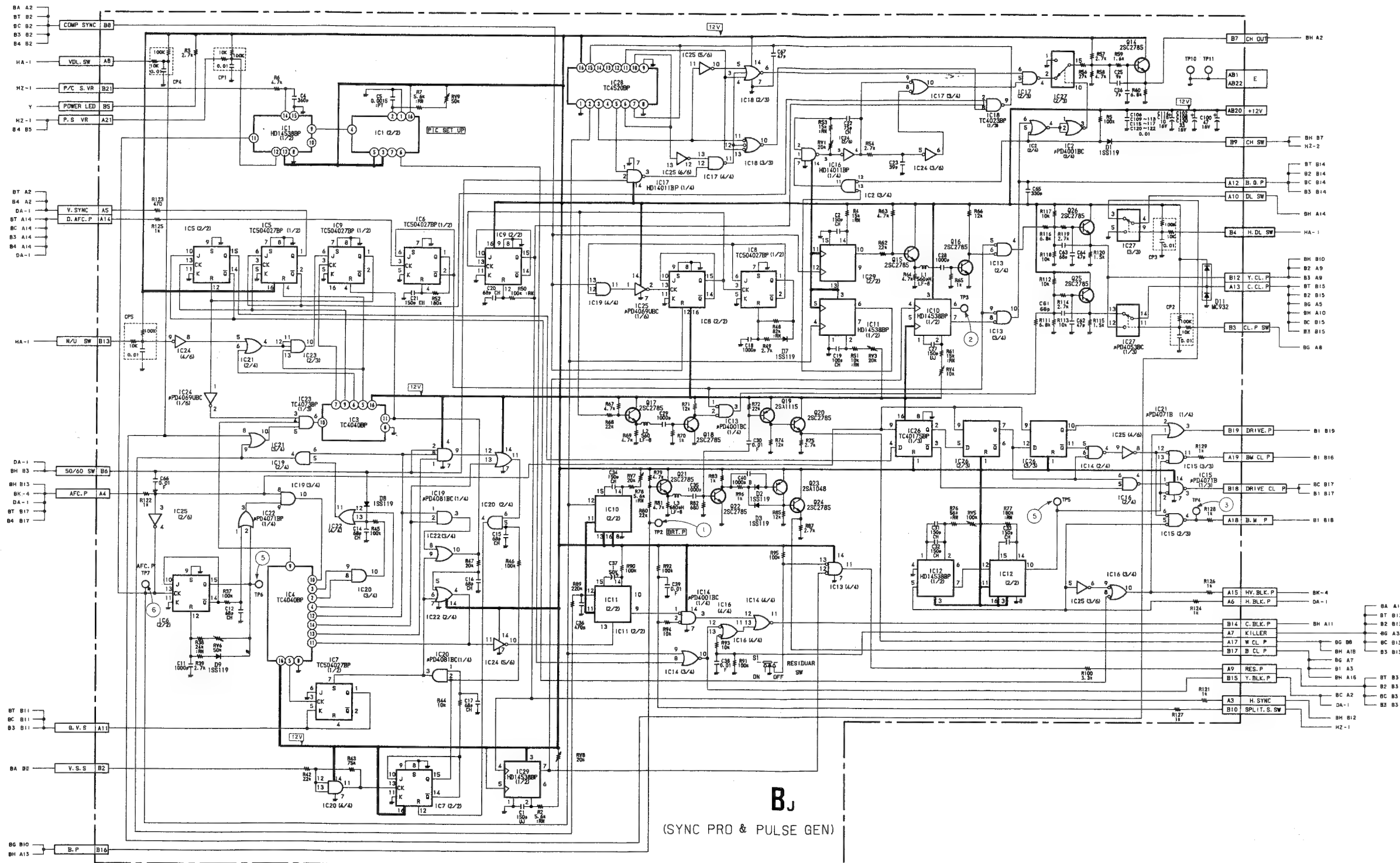
(SYNC PRO & PULSE GEN)

BJ board (SYNC PROCESSING & PULSE GEN)

IC	6 19 1	24 21 7	20 23 4	22 26 3	12 18 15	9 25 14	8 17 27	11 16 28	10 13 5	29 2			
Q										21 20	19	17 15	24 23 22 18 25 26 16 14
D	9		8				7						3 2
TP ADJ	RV6 TP7	TP6	RV5 TP11	TP5 TP4		TP10			RV3 RV4 RV1 RV7 RV8 TP3 TP2				

• ▭ : Pattern from the side which enables seeing.

• ▨ : Pattern of the rear side.

BK board (VIDEO OUT AMP)

IC											1
Q	113 112 213 212 313 312	110 111 210 211 310 311	108 109 208 209 308 309	106 107 206 207 306 307	104 105 204 205 304 305	103 115 203 215 303 315	102 101 202 201 302 301 314		13	12 114 214	1
D	111 110 109 211 210 209 311 310 309	112 113 212 213 312 313	107 114 108 116 207 214 208 216 307 314 308 316	115 215 315	104 103 106 105 204 203 206 205 304 303 306 305		101 102 201 202 301 302			1 2	
TP ADJ	TP1	TP101 TP102 TP103			CV102 CV202 CV302		CV101 CV201 CV301				

• [ ] : Pattern from the side which enables seeing.
• [ ] : Pattern of the rear side.

BK board (VIDEO OUT AMP)

B_K

(VIDEO OUT)

BK BOARD

(VIDEO OUT)

IC1	NJM4558D	LIPPLE FILTER
Q1	2SA844	INVERTER
12	2SA1091	LIPPLE FILTER
13	2SA1091	LIPPLE FILTER
101	2SC2668	R-PRE AMP.
102	2SA844	R-PRE AMP.
103	2SC403SP	BUFF.
104	2SC403SP	BUFF.
105	2SA844	BUFF.
106	2SA1406	R-VIDEO OUT
107	2SC3600	R-VIDEO OUT
108	2SC3600	BUFF.
109	2SA1406	BUFF.
110	2SC3600	BUFF.
111	2SA1406	BUFF.
112	2SC2551	R-CLAMP
113	2SC403SP	R-CLAMP
114	2SC403SP	R-CLAMP
115	2SC403SP	BLANK PULSE BUFF.
201	2SC2668	G-PRE AMP.
202	2SA844	G-PRE AMP.
203	2SC403SP	BUFF.
204	2SC403SP	BUFF.
205	2SA844	BUFF.
206	2SA1406	G-VIDEO OUT
207	2SC3600	G-VIDEO OUT
208	2SC3600	BUFF.
209	2SA1406	BUFF.
210	2SC3600	BUFF.
211	2SA1406	BUFF.
212	2SC2551	G-CLAMP
213	2SC403SP	G-CLAMP
214	2SC403SP	G-CLAMP
215	2SC403SP	BLANK PULSE BUFF.
301	2SC2668	B-PRE AMP.
302	2SA844	B-PRE AMP.
303	2SC403SP	BUFF.
304	2SC403SP	BUFF.
305	2SA844	BUFF.
306	2SA1406	B-VIDEO OUT
307	2SC3600	B-VIDEO OUT
308	2SC3600	BUFF.
309	2SA1406	BUFF.
310	2SC3600	BUFF.
311	2SA1406	BUFF.
312	2SC2551	B-CLAMP
313	2SC403SP	B-CLAMP
314	2SC403SP	B-CLAMP
315	2SC403SP	BLANK PULSE BUFF.

D1	1SS148	INVERTER
2	1SS148	INVERTER
101	1SS148	BIAS
102	1SS148	BIAS
103	1SS148	BIAS
104	1SS148	BIAS
105	1SS148	BIAS
106	1SS148	BIAS
107	1SS148	BIAS
108	1SS148	BIAS
109	1SS83	CLAMP
110	RU-1A	PROTECTOR
111	RU-1A	PROTECTOR
112	1SS148	PROTECTOR
113	1SS148	PROTECTOR
114	1SS148	PROTECTOR
115	1SS148	PROTECTOR
116	1SS148	PROTECTOR
201	1SS148	BIAS
202	1SS148	BIAS
203	1SS148	BIAS
204	1SS148	BIAS
205	1SS148	BIAS
206	1SS148	BIAS
207	1SS148	BIAS
208	1SS148	BIAS
209	1SS83	CLAMP
210	RU-1A	PROTECTOR
211	RU-1A	PROTECTOR
212	1SS148	PROTECTOR
213	1SS148	PROTECTOR
214	1SS148	PROTECTOR
215	1SS148	PROTECTOR
216	1SS148	PROTECTOR
301	1SS148	BIAS
302	1SS148	BIAS
303	1SS148	BIAS
304	1SS148	BIAS
305	1SS148	BIAS
306	1SS148	BIAS
307	1SS148	BIAS
308	1SS148	BIAS
309	1SS83	CLAMP
310	RU-1A	PROTECTOR
311	RU-1A	PROTECTOR
313	1SS148	PROTECTOR
314	1SS148	PROTECTOR
315	1SS148	PROTECTOR
316	1SS148	PROTECTOR

5. DIAGRAMS

① 3.6Vp-p (H)
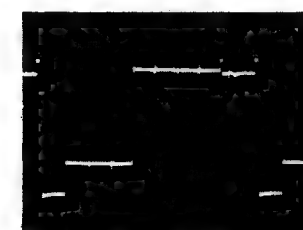
③ 4.0Vp-p (H)

⑤ 3.0Vp-p (H)

② 60Vp-p (H)

④ 66Vp-p (H)

⑥ 54Vp-p (H)

DA BOARD

IC1	MB84027B	H. BLK. WIDTH
2	HD14011BP	H. DELAY. POSITION
3	TC4093BP	BUFFER
4	CX-158	H. OSC AFC
5	TLO82CP	H. LIN. GEN.
6	TLO82CP	H. LIN. GEN.
7	MC1496P	H. LIN. MOD.
8	NJM2903D	1/2H, 1/2V. GEN.
9	TLO82CP	H. BLK. PHASE
10	NJM2903D	T & B. H. PHASE
11	TLO82CP	T & B. PIN. GEN.
12	MC1496P	T & B. PIN. MOD.
13	uPD4066BC	50/60 SW.
14	uPD4066BC	DEF. LEVEL. SW
15	uPD4066BC	DEF. LEVEL. SW
16	uPD4066BC	DEF. LEVEL. SW
17	NJM4558D	BUFFER
18	NJM4558D	50/60 SELECTOR
19	NJM4558D	V. SAWTOOTH. GEN.
20	NJM4558D	SIDE. PIN. GEN.
21	NJM4558D	SIDE. PIN. GEN.
22	NJM4558D	V. SAWTOOTH GEN.
23	NJM4558D	BUFFER
24	uPC78M12H	+12V REG.
25	uPC79M12H	-15V REG.
26	TLO82CP	BUFFER
Q1	DTC144ES	H. OSC. SW
2	2SC2785	H. LIN. GEN
3	2SC2785	H. LIN. GEN
4	2SC2785	1/2H. P. GEN.
5	2SC2785	H. BLK. GEN.
6	2SC2785	H. BLK. GEN.
7	2SC2785	T & B PIN. PHASE

8	2SC2785	T & B PIN. GEN.
9	2SC3068	T & B PIN. GEN.
10	2SC2785	T & B PIN. MOD.
12	DTC144ES	50/60 SW
13	DTC144ES	SCAN. SW
14	DTC144ES	SCAN. SW
15	DTC144ES	SCAN. SW
16	DTC144ES	SCAN. SW
17	DTC144ES	SCAN. SW
18	2SC2785	BUFFER
19	2SC2785	V. SAW. GEN
20	2SC2785	V. SAW. CLIP
21	2SC2785	SIDE PIN GEN
22	2SC2785	SIDE PIN GEN
23	2SC2785	SIDE PIN GEN
24	2SC2785	V. SAW GEN
31	DTC144ES	V. LIN GEN
D1	1SS148	H. DELAY SW
2	1SS148	H. DELAY SW
3	RD6.8EB3	CLIPPER
4	RD6.8EB3	CLIPPER
5	RD12E-B3	50/60 SW
6	RD12E-B3	SCAN SW
7	1SS148	SCAN SW
8	1SS148	SCAN SW
9	RD7.5E-B3	+7.5V REG.
10	RD7.5E-B3	-7.5V REG.
11	RD15E-B3	50/60 SW
12	RD5.6E-B2	V. SAW. CLIP
13	1SS148	V. SAW. CLIP
14	1SS148	V. SAW. CLIP
15	1SS148	AFC.CLIP
18	1SS148	PROT
19	1SS148	

5. DIAGRAMS

① 14Vp-p (H)   ④ 10Vp-p (H)   ⑦ 2.5Vp-p (V)

② 14Vp-p (H)   ⑤ 4.5Vp-p (H)   ⑧ 12Vp-p (V)

③ 9Vp-p(H)   ⑥ 1.8Vp-p (V)   ⑨ 12Vp-p(V)   ⑩ 8Vp-p (V)

DA board (DEFLECTION WAVEFORM)

DA board (DEFLECTION WAVEFORM)

(DEFLECTION WAVEFORM) **D**A
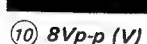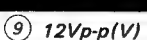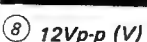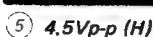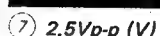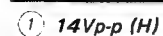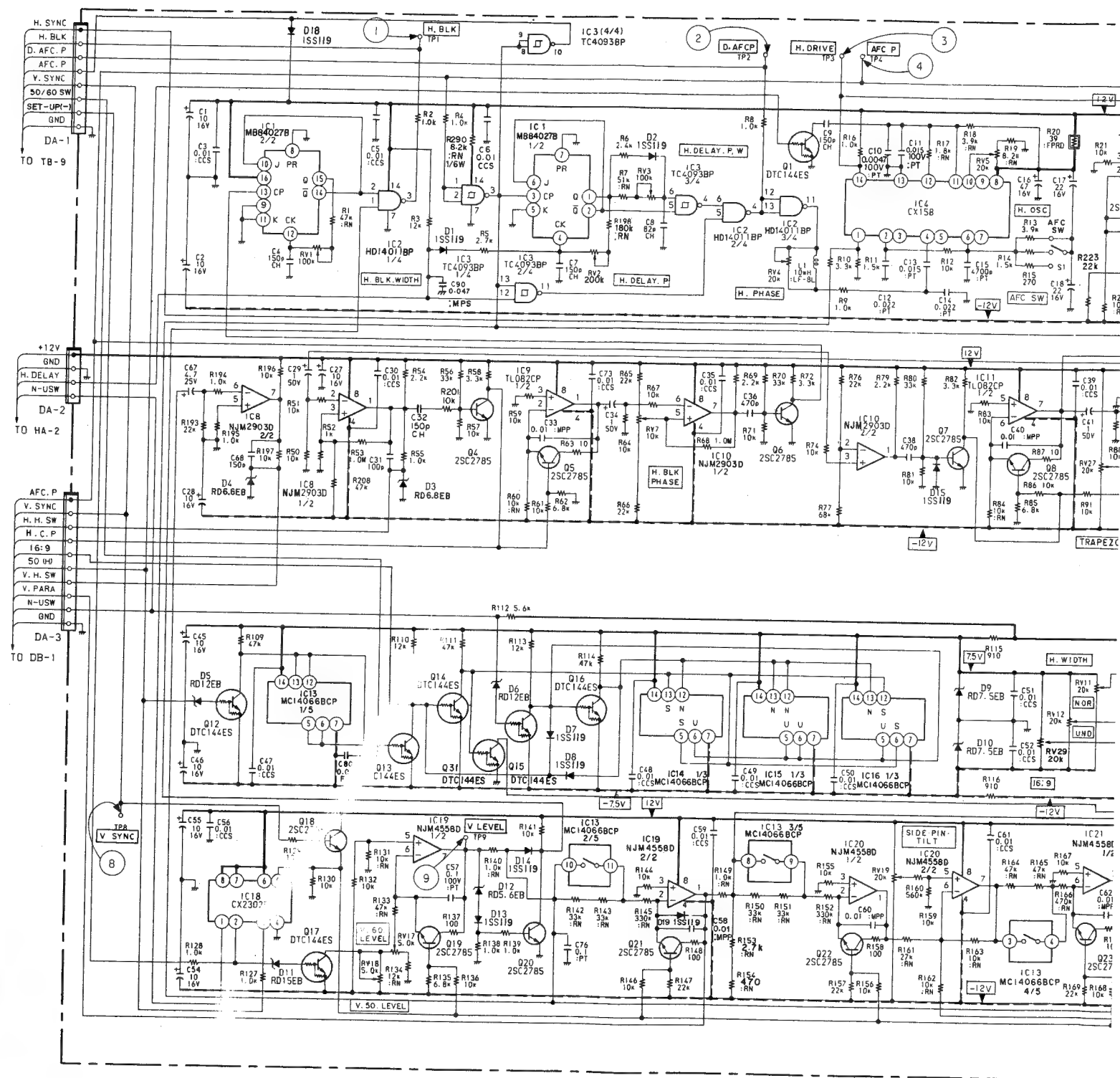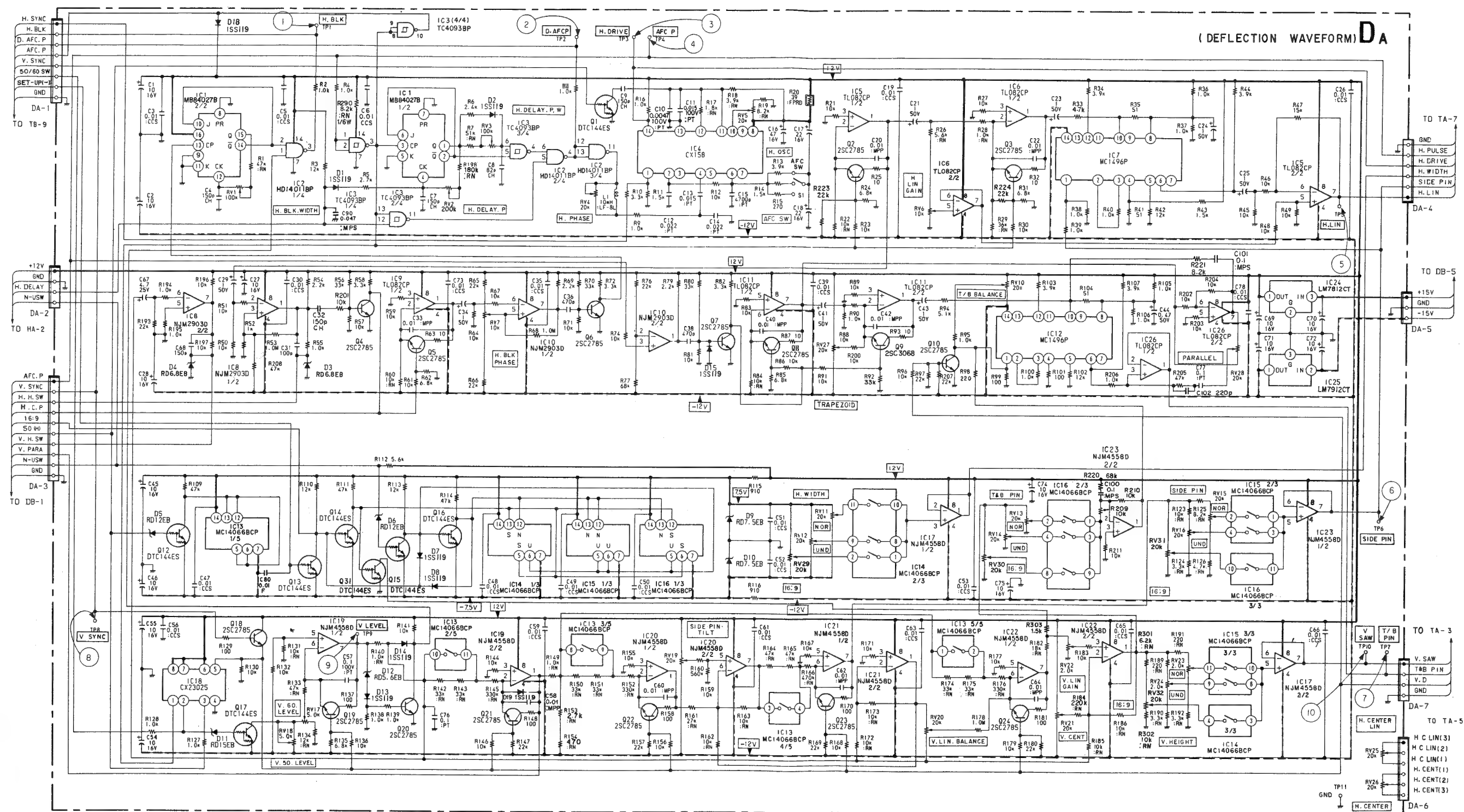
DA board (DEFLECTION WAVEFORM)

IC	Q	D	TP	ADJ
7	18	4		
		11		
8 18 17	17			
		3	TP6	RV18
		13	RV29 RV12	RV11
			RV6	RV17
14	19	14	TP8	
5,6,9	4,20		TP5	
		12		
	5 21		TP9	
			RV32 RV24	RV23
19	2 3		TP3	RV7
25	15			
			RV5	
10				RV19
			RV31 RV16	RV15
4		1 22		
20		6		
		7	5	
16				RV4
13	8		RV30 RV14	RV13
24	12		TP2	
				RV28
2	23			
			TP1	
11,26		9		
3	21	16 9 10	TP4	
		18		
9		23	TP7 RV27	RV21
		1 8 6	RV1	RV20
11			TP10	
		13,14 15,16		
1 12 22		7	TP11	
		24 2		
		31	RV2 RV10	RV26
		10	RV3 RV22	RV25

• : Pattern from the side which enables seeing.

• : Pattern of the rear side.

DB board (CONVERGENCE WAVEFORM)

IC	Q	D	TP	ADJ
				11
16	38 33 34			
10 15		4 3	9	26 21 16 11 6 1
8	40 41			27 22 17 12 7 2
	35		2 10	28 23 18 13 8 3
	36	5	1	29 24 19 14 9 4
	37			30 25 20 15 10 5
9 3	101			33 31 32
	10 12			56 51 46 41
12	11			57 52 47 42
			3 4	58 61 53 48 43
17	15 17		8	59 54 49 44
4	13 14 16 19			60 55 50 45
	18 20 49			
	46 45 48 42			
	21 25 47 4	2		
5 6	5 2			
1	23 27			
	22 24 26 28 6	10		
	7 29 3 44			
2 7	11			
	43 31		12	
	8 9 30 32	7	8	
		6	5	
	13 14			

H.CONVERGENCE   V.CONVERGENCE

SONY   1-642-047-12   DB

CAD

• : Pattern from the side which enables seeing.
• : Pattern of the rear side.
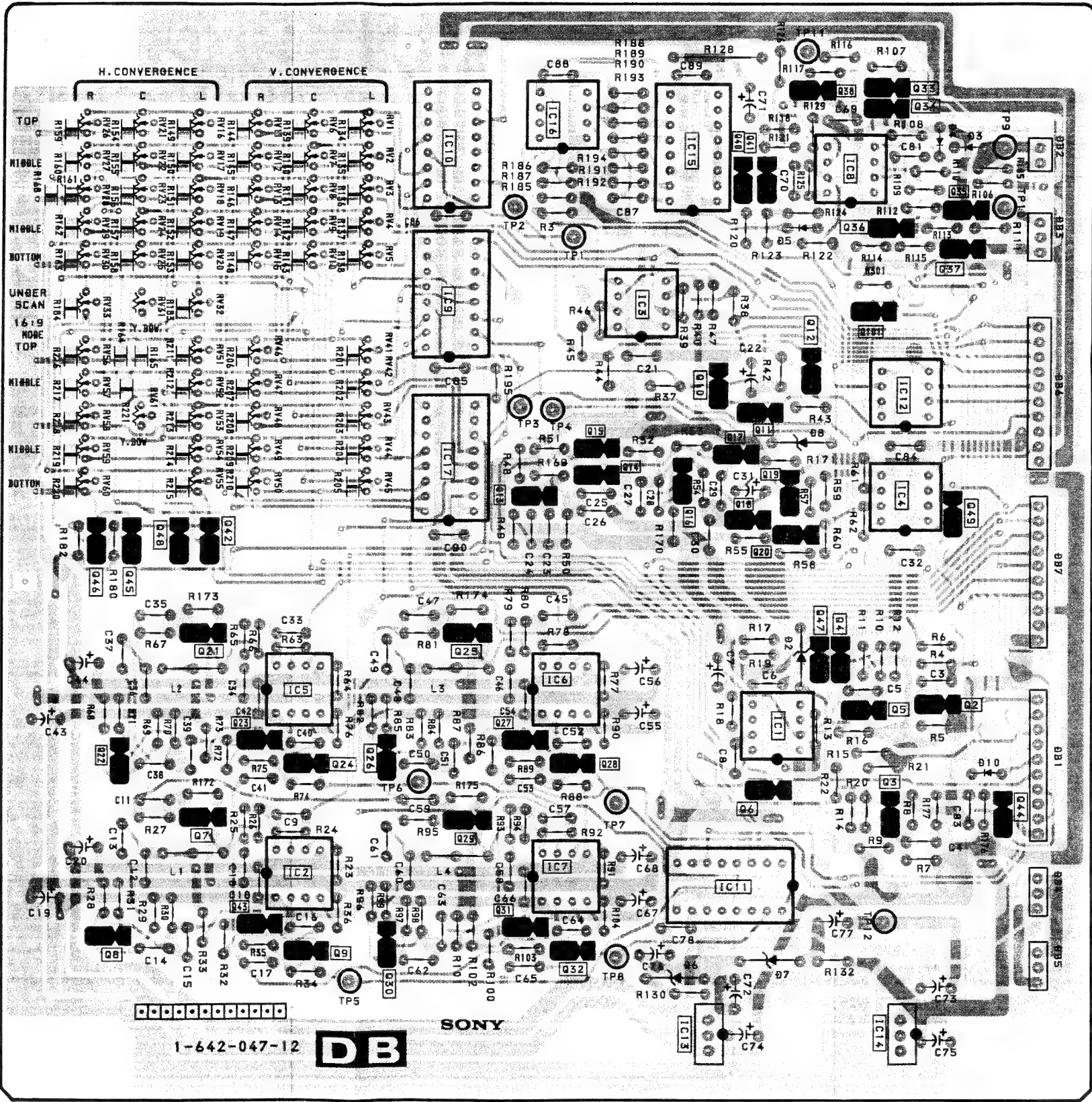
DB board (CONVERGENCE WAVEFORM)
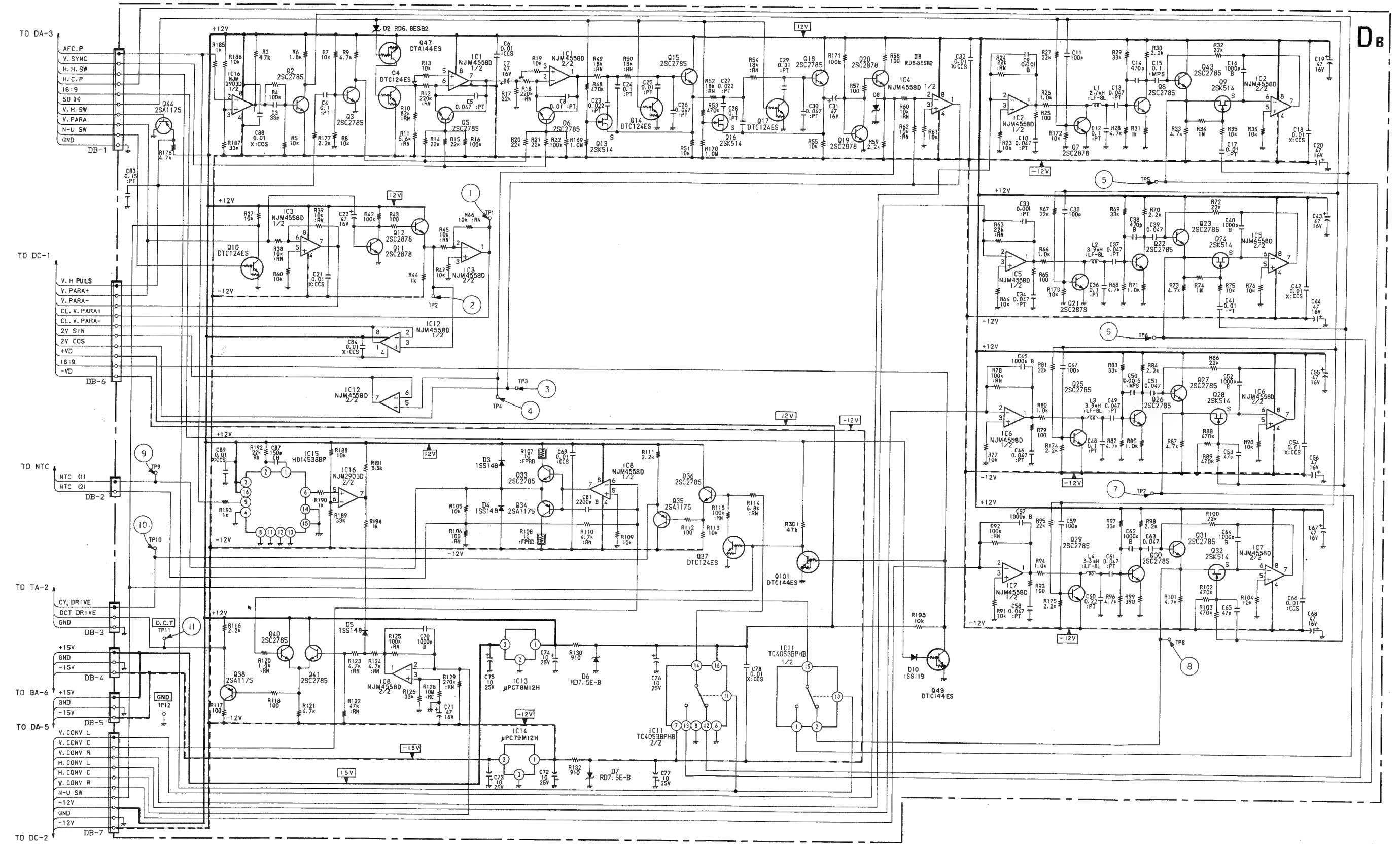
DB BOARD

IC 1	NJM4558D	2XV GEN
2	NJM4558D	AMP & CLAMP
3	NJM4558D	INVERTER
4	NJM4558D	INVERTER
5	NJM4558D	AMP & CLAMP
6	NJM4558D	AMP & CLAMP
7	NJM4558D	AMP & CLAMP
8	NJM4558D	AMP
11	TC4053BPHB	1/2HV. SW
12	NJM4558D	BUFFER
13	uPC78M12H	+12V REG.
14	uPC79M12H	-12V REG.
15	HD14538BP	H.CONV CLAMP
16	NJM2903D	INVERTER

Q 2	2SC2785	H. SW
3	2SC2785	2XV. PULSE GEN
4	DTC124ES	50/60 SW
5	2SC2785	2XV SW
6	2SC2785	2XV SW
7	2SC2878	H. SW
8	2SC2785	AMP
9	2SK514	H. CLAMP
10	DTC124ES	N/U SW
11	2SC2878	CLAMP
12	2SC2878	BUFFER
13	2SK514	50/60 SW
14	DTC124ES	50/60 SW
15	2SC2785	50/60 SW
16	2SK514	50/60 SW
17	DTC124ES	50/60 SW
18	2SC2785	BUFFER
19	2SC2878	CLAMP

Q 20	2SC2878	BUFFER
21	2SC2878	H. SW
22	2SC2785	AMP
23	2SC2785	H. CLAMP
24	2SK514	H. CLAMP
25	2SC2785	H. SW
26	2SC2785	AMP
27	2SC2785	H. CLAMP
28	2SK514	H. CLAMP
29	2SC2785	H. SW
30	2SC2785	AMP
31	2SC2785	H. CLAMP
32	2SK514	H. CLAMP
33	2SC2785	N.T.C AMP
34	2SA1175	N.T.C AMP
35	2SA1175	BUFFER
36	2SC2785	BUFFER
37	DTC124ES	N/U SW
38	2SA1175	BUFFER
40	2SC2785	ADDER
41	2SC2785	ADDER
43	2SC2785	H.CLAMP
44	2SA1175	BUFFER
47	DTA144ES	16:9 SW
49	DTA144ES	INVERTER
101	DTA144ES	N/U SW

D 2	RD6.8ESB2	LEVEL SHIFT
3	1SS148	PROTECTER
4	1SS148	PROTECTER
5	1SS148	DC STOPPER
6	RD7.5E-B3TN	+7.5V REG.
7	RD7.5E-B3TN	-7.5V REG.
8	RD6.8ESB2	LIMITTER
10	1SS148	DC STOPPER

5. DIAGRAMS
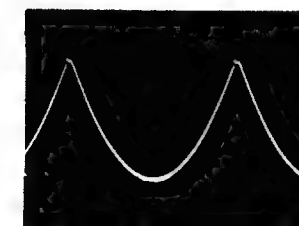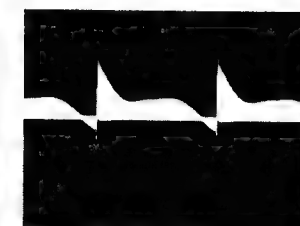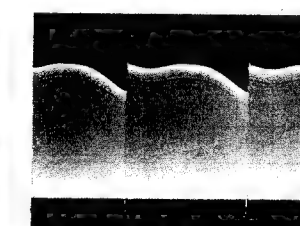
① 5.8Vp-p (V) ⑤ 1.5Vp-p (V) ⑧ 1.8Vp-p (V) ⑪ 4.8Vp-p (H)
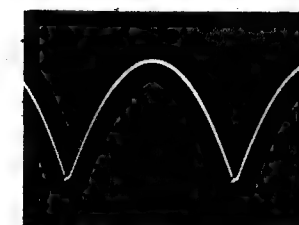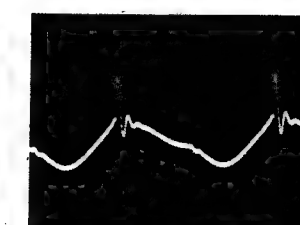
② 5.8Vp-p (V) ⑥ 1.5Vp-p (V) ⑨ 1Vp-p (V) ⑫ 4.8Vp-p (V)
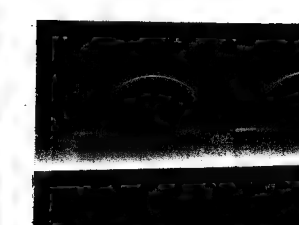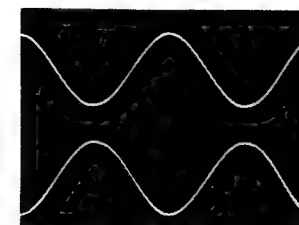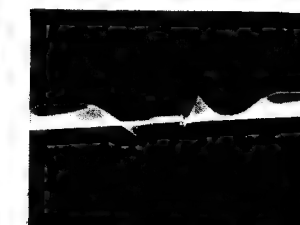
③ 2.0Vp-p (V) ⑦ 1.8Vp-p (V) ⑩ 1.5Vp-p (V)
④ 2.0Vp-p (V)

DC board (CONVERGENCE CONTROL)

IC1	XRU4053BF	1/2 HV.SW
2	XRU4053BF	1/2 HV.SW
3	XRU4053BF	
Q1	DTC144EK	UND.Y BOW
2	DTC144EK	UND.H.AMP
3	DTC144EK	UND.H.AMP
4	DTC144EK	

(CONVERGENCE)
(CONTROL) **D**c
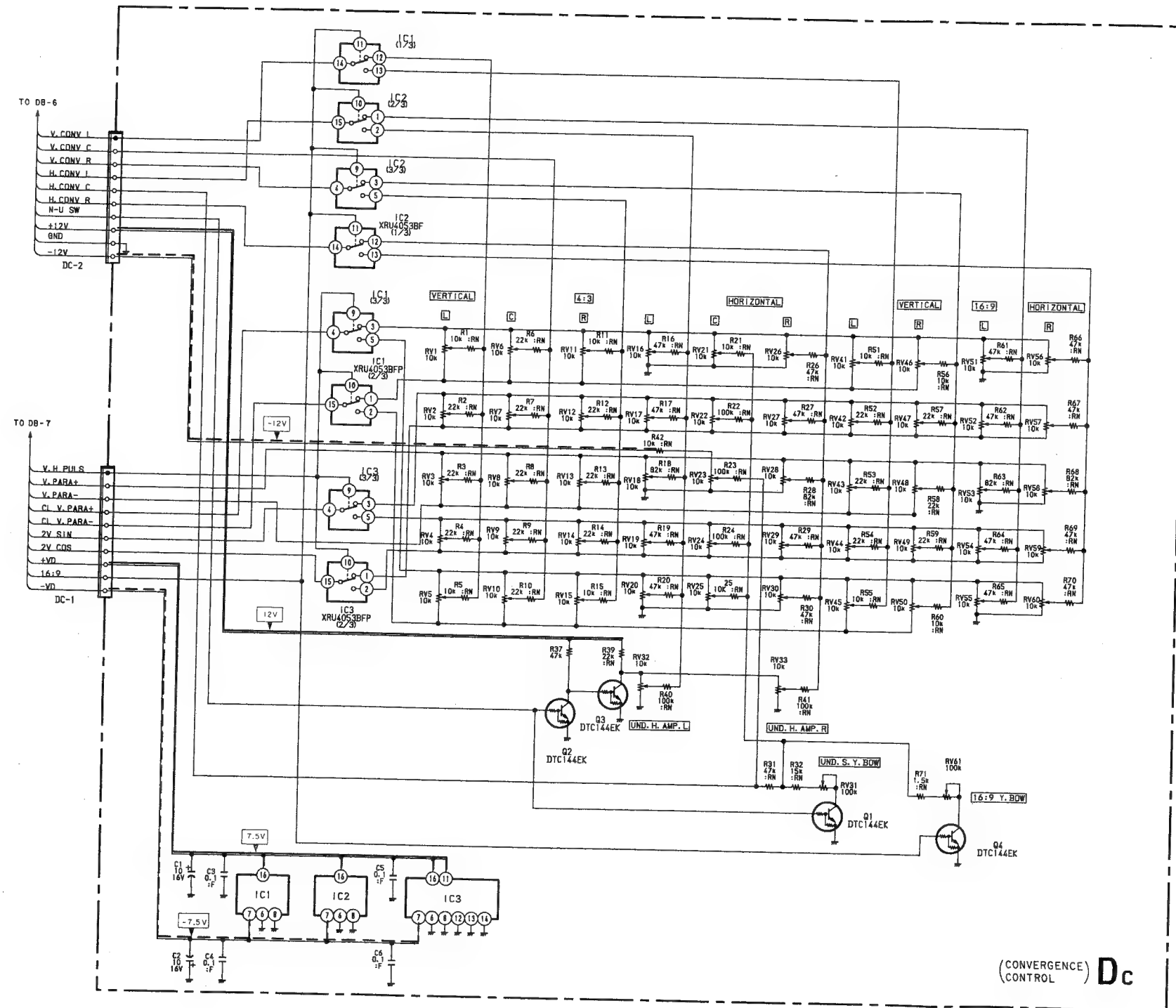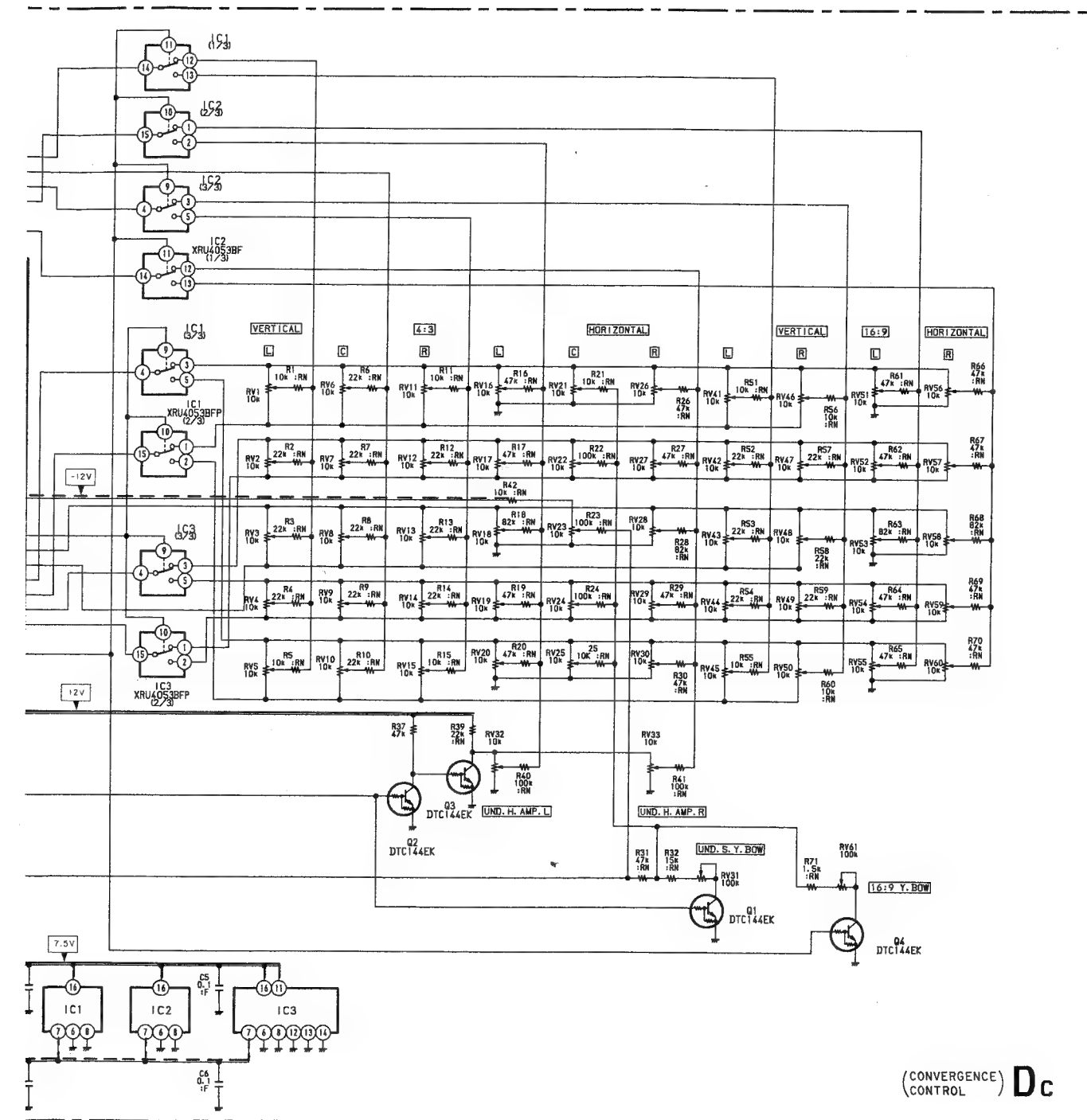
DC board (CONVERGENCE CONTROL)

• [___] : Pattern from the side which enables seeing.
• [▨▨▨] : Pattern of the rear side.

V CONV H CONV
L C R L C R

V CONVERGENCE

4:3

R   C   L   16:9

BC-2

RV1 RV6 RV1 RV41
R11 R6   R1   R51

RV12 RV7 RV2 RV42   C4   C3
R12 R7   R2   R52

RV13 RV8 RV3 RV43
R13 R8   R3   R53

RV14 RV9 RV4 RV44
R14 R9   R4   R54

RV15 RV10 RV5 RV45
R15 R10 R5   R55   C6 C5

IC1
IC2
IC3

V-H
VP+
VP-
CVP+
CVP-
SIN
COS
+VB
16/4
-VB

C2
C1

BC-1

• : Pattern from the side which enables seeing.
• : Pattern of the rear side.

EA board (H OUT)

IC										1							2									
Q	10		11				4	12	2	5 3 16 15	1									14					13	
D		8		9	7		3	4	1 2	16 15				12	11		14 13			10						
TP	TP 3 TP 4					TP1								TP 2												

EB board (V OUT)

Q			5 7 8	3	6 4	1	2
D				5	4 1 2 3		
		6					
TP	TP1						

1-617-881-17

1-617-882-16

5. DIAGRAMS

EB board (V OUT)

Q				5	6					18		19		12		13		
		7			3	4				16		17				11		
		8				1	2			15						10	9	
										14								
D				5	4	1 2 3				9 10 21				7 8				
		6																
TP		TP1						TP5			TP4		TP3				TP2	

EA / SONY

EB / SONY

TP3 ⬤ DCT OUT

TP1 ⬤ V.OUT

TP2 ⬤ CY OUT

TP4 — DF OUT / DYN.FOCUS

TP5 E

1-617-882-16

GND 18V +18V +150V VNF(DY) V.D W.OUT(DY) T/B.PIN V.SAW DCT.DRIVE DCT.OUT D.F.P

L1 T2 CY.NF CY.DRIVE CY.OUT GND NC

5-77   5-78

• : Pattern from the side which enables seeing.
• : Pattern of the rear side.

EA board (H OUT)
EB board (V OUT)
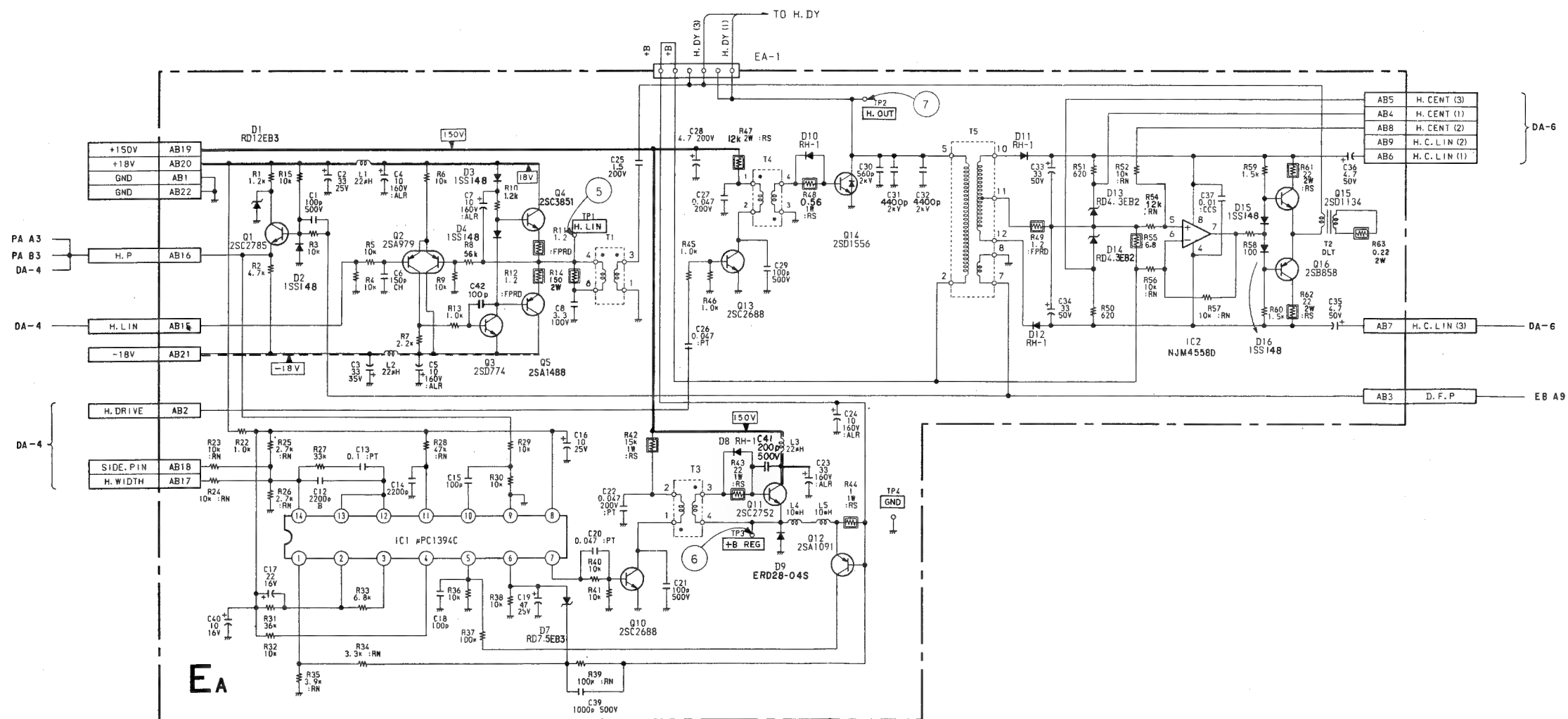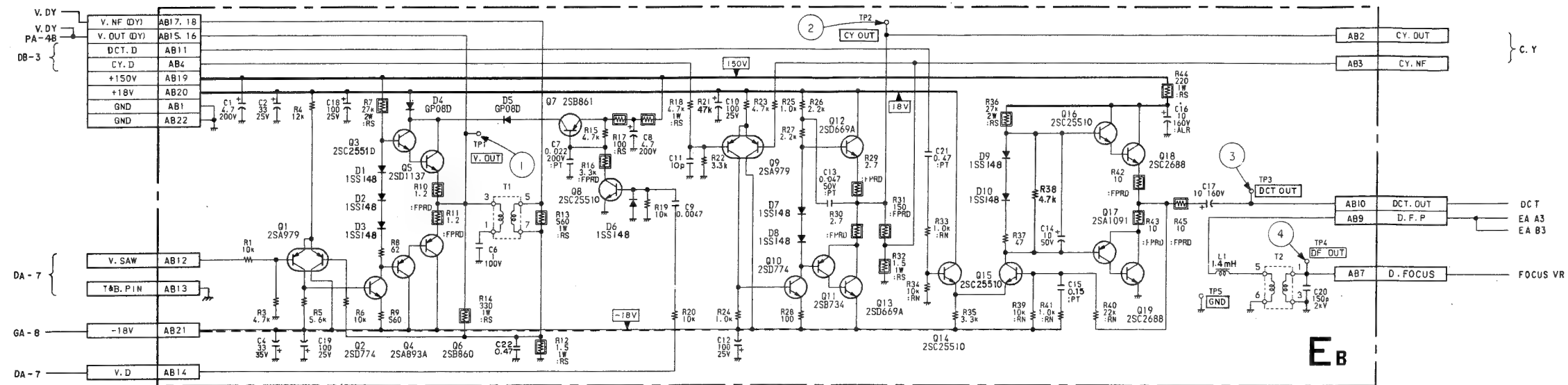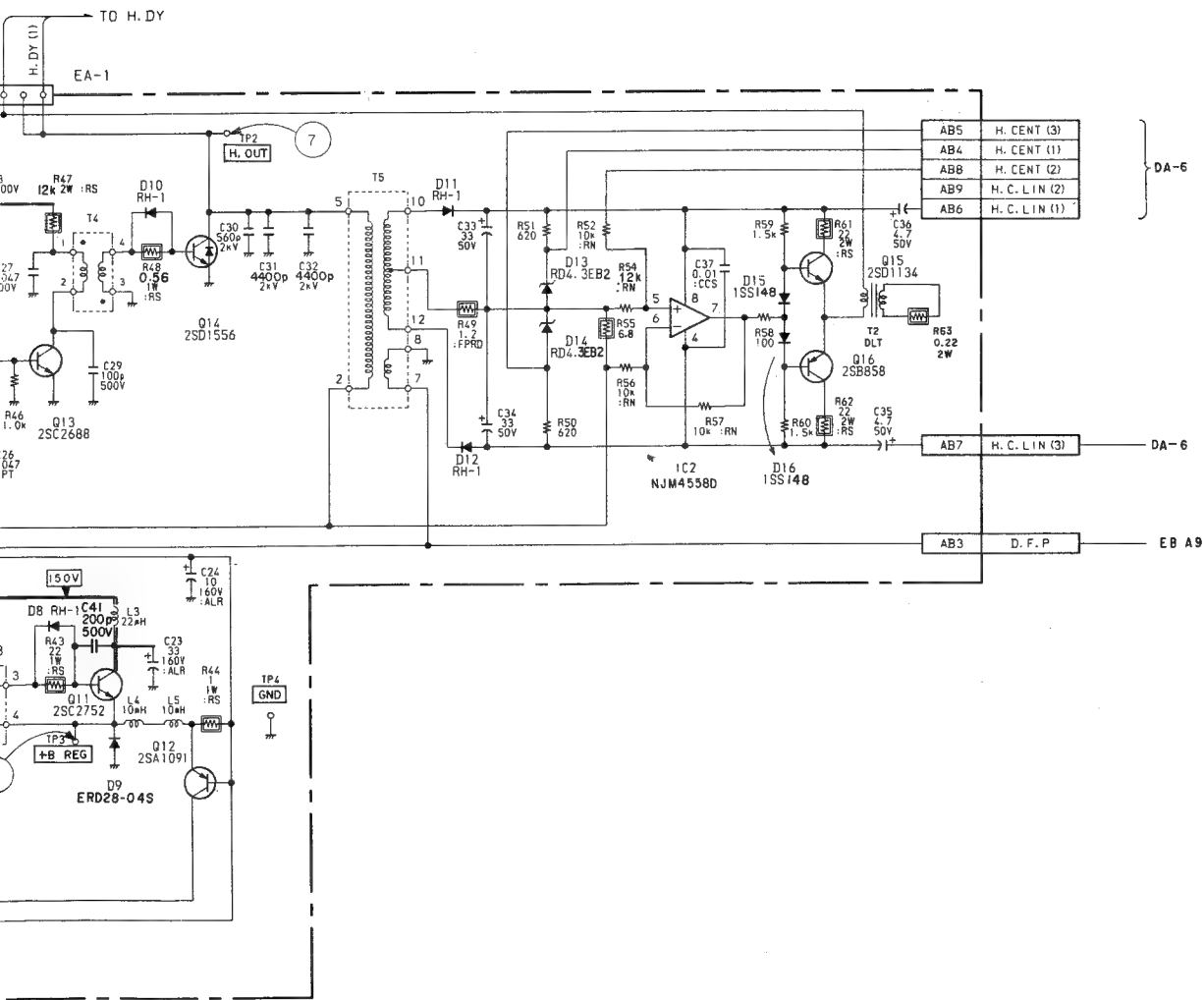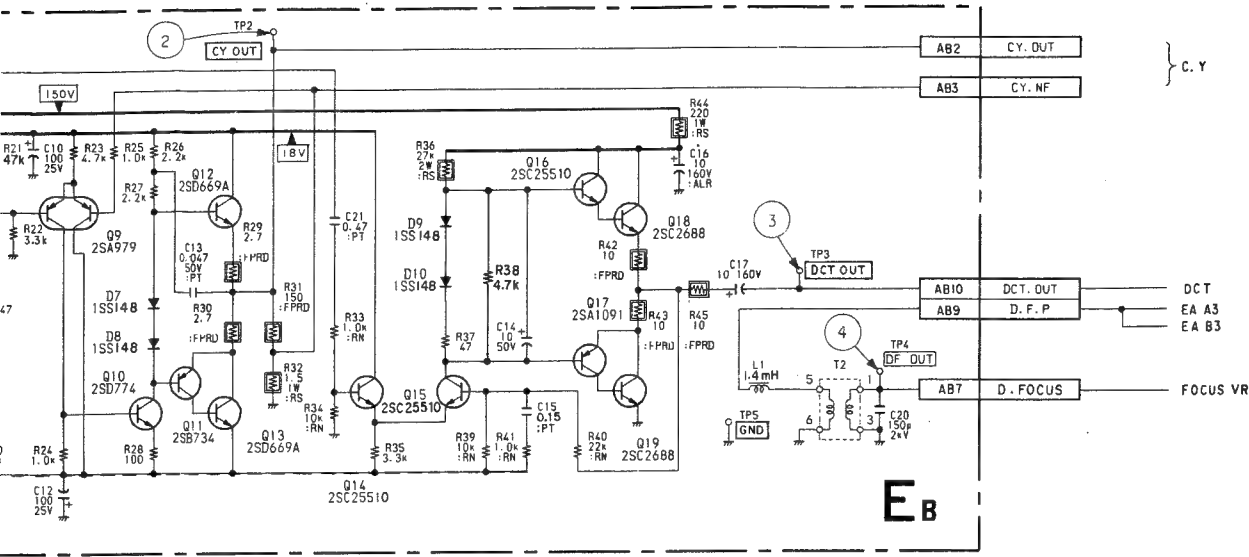
EA BOARD

IC1	uPC1394C	P.W.M CONTROL
2	NJM4558D	H.CENT
Q1	2SC2785	H.PULSE BUFFER
2	2SA979	H.LIN AMP
3	2SD774	H.LIN AMP
4	2SC3851	H.LIN AMP OUT
5	2SA1488	H.LIN AMP OUT
10	2SC2688	P.W.M DRIVE
11	2SC2752	P.W.M OUT
12	2SA1091	O.C.P
13	2SC2688	H.DRIVE
14	2SD1556	H.OUT
15	2SD1134	H.CENT
16	2SB858	H.CENT
D1	RD12E-B3	CLIPPER
2	1SS148	PROTECTOR
3	1SS148	BIAS
4	1SS148	BIAS
7	RD7.5E-B3	PROTECTOR
8	RH-1	P.W.M DRIVE
9	ERD28-04S	P.W.M SW
10	RH-1	H.DRIVE
11	RH-1	H.P.RECT.
12	RH-1	H.P.RECT.
13	RD4.3E-B2	+4.3V REG
14	RD4.3E-B2	-4.3V REG
15	1SS148	BIAS
16	1SS148	BIAS

EB BOARD

Q1	2SA979	V.AMP
2	2SC3209	V.AMP
3	2SC25510	V.AMP
4	2SA1091	V.AMP
5	2SC32983	V.AMP OUT
6	2SA1306B	V.AMP OUT
7	2SB861	V.RETRACE SW
8	2SC25510	V.RETRACE SW
9	2SA979	CY.AMP
10	2SD774	CY.AMP
11	2SB734	CY.AMP
12	2SD669A	CY.AMP OUT
13	2SD669A	CY.AMP OUT
14	2SC25510	D.C.T AMP
15	2SC25510	D.C.T AMP
16	2SC25510	D.C.T AMP
17	2SA1091	D.C.T AMP
18	2SC2688	D.C.T AMP OUT
19	2SC2688	D.C.T AMP OUT
D1	1SS148	BIAS
2	1SS148	BIAS
3	1SS148	BIAS
4	GP08D	DC.STOPPER
5	GP08D	DC.STOPPER
6	1SS148	PROTECTOR
7	1SS148	BIAS
8	1SS148	BIAS
9	1SS148	BIAS
10	1SS148	BIAS
21	1SS148	PROTECTOR
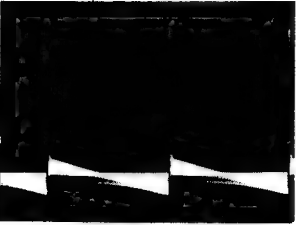
① 90Vp-p (V)
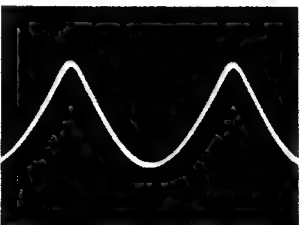
④ 840Vp-p (H)
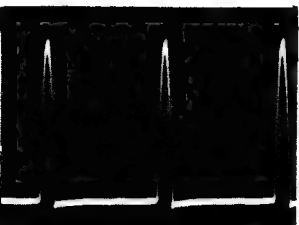
⑦ 920Vp-p (H)

② 0.3Ap-p (V)

⑤ 30Vp-p (H)
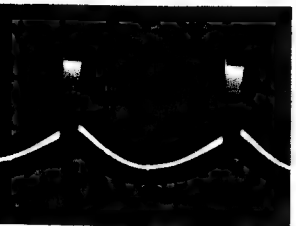
③ 100Vp-p (H)

⑥ 150Vp-p (H)

5. DIAGRAMS

GB board (OVER VOLTAGE PROTECTOR)
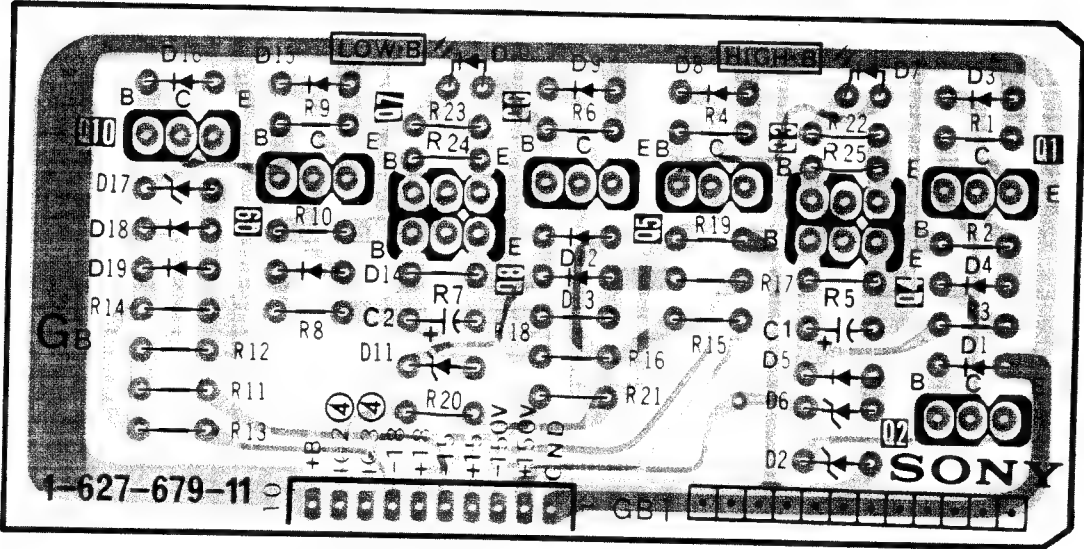
GA board (AC RECT, DC REG)

IC	Q	D	ADJ·TP
		23 25	
	11		TP2
	12	24	TP3
	10	18	
			RV1
		21	
	13	11	RV2 TP4
		5 6	TP5
2	14	2	
3			TP1
	20	13	
7	5	12	
9	6 3	15	10
8		14 16	1
	7	17	
		31,32	
		29 27	
		30	
		26	
		22	
		28	
1		3 4	
	2 1	9 8	

GA board (AC RECT, DC REG)

IC	Q	D	ADJ·TP
		23 25	
	11		TP2
	12	24	TP3
	10	18	
			RV1
		21	
	13	11	RV2 TP4
		5 6	TP5
		2	
2	14		
3			TP1
		20 13	
7	5	15 12	
9 6 3		14 10	
8		16 1	
		17	
		7	
		31, 32	
		29 27	
		30	
		26	
1			
		22	
		28	
		3 4	
2 1		9 8	

S-C5

(TO S901)

GA

SONY

GA-4

GA-3 (TO VOLTAGE CHANGE SW)

GA-2 (TO FUSE)

GA-1 (TO 3P INLET)

1-617-883-15

- : Pattern from the side which enables seeing.
- : Pattern of the rear side.

GA board (AC RECT, DC REG)
GB board (OVER VOLTAGE PROTECTOR)
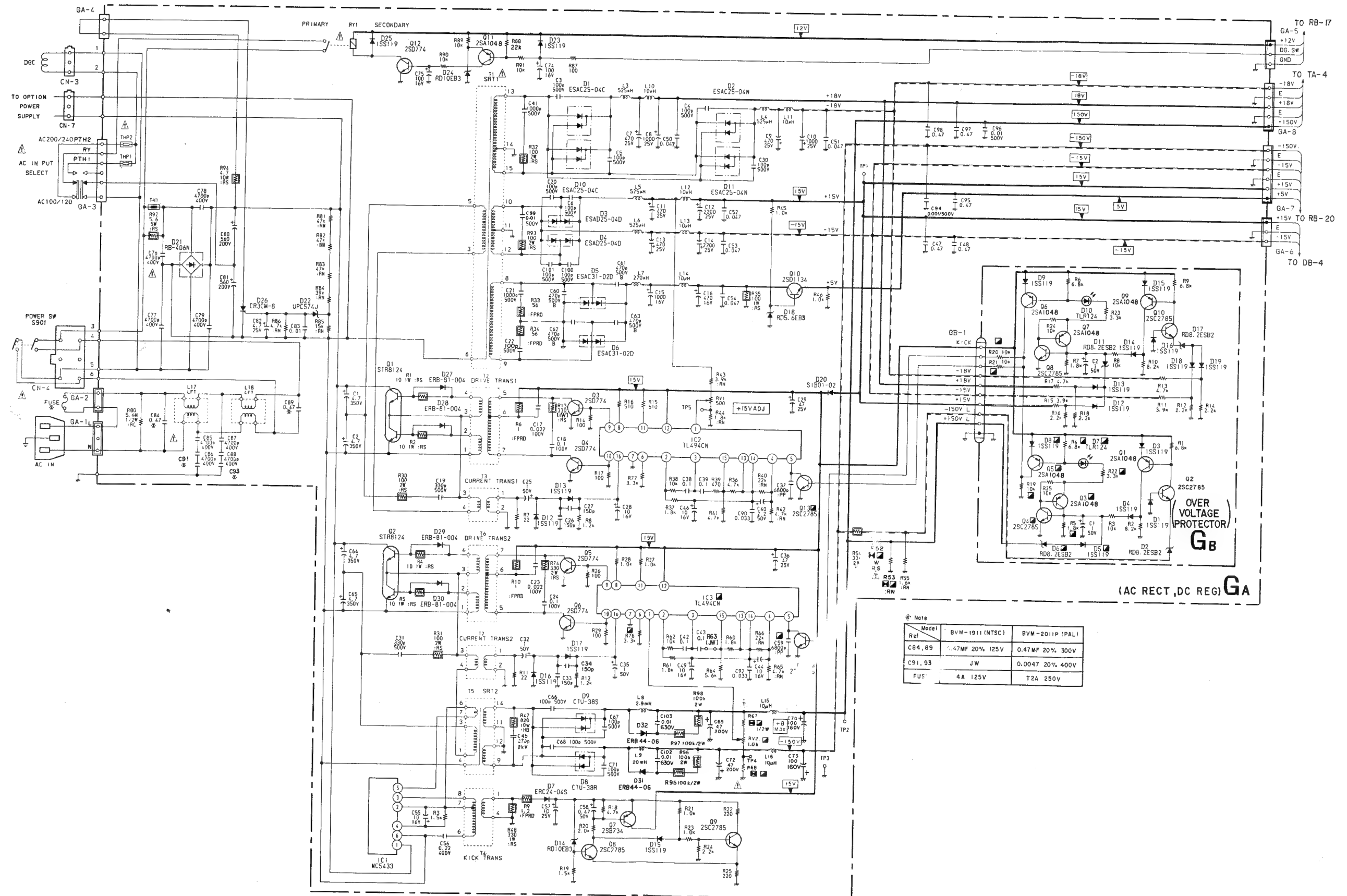
(AC RECT, DC REG) GA

OVER VOLTAGE PROTECTOR GB

Model Ref	BVM-1911 (NTSC)	BVM-2011P (PAL)
C84, 89	0.47MF 20% 125V	0.47MF 20% 300V
C91, 93	JW	0.0047 20% 400V
FUS	4A 125V	T2A 250V

GA BOARD

IC1	MC5433	STARTER
2	TL494CN	DC REG
3	TL494CN	DC REG
Q1	STR8124	DC-DC CONV.
2	STR8124	DC-DC CONV.
3	2SD774	CONV. DRIVE
4	2SD774	CONV. DRIVE
5	2SD774	CONV. DRIVE
6	2SD774	CONV. DRIVE
7	2SB734	SOFT. START
8	2SC2785	SOFT. START
9	2SC2785	SOFT. START
10	2SD1134	+5V REG.
11	2SA1048	D.G. CONTROL
12	2SD774	D.G. CONTROL
13	2SC2785	O.V.P SW
14	2SC2785	O.V.P SW
D1	ESAC25-04C	+18V RECT
2	ESAC25-04N	-18V RECT
3	ESAD25-04D	+15V RECT
4	ESAD25-04D	-15V RECT
5	ESAC31-02D	+5V RECT
6	ESAC31-02D	-5V RECT
7	ERC24-045	START. RECT
8	CTU-38R	-150V RECT
9	CTU-38S	+150V RECT
10	ESAC25-04C	+18V RECT
11	ESAC25-04N	-18V RECT
12	1SS119	O.C.P RECT
13	1SS119	O.C.P RECT
14	RD10EB3T	STARTER
15	1SS119	STARTER
16	1SS119	O.C.P RECT
17	1SS119	O.C.P RECT
18	RD5.6E-B3TN	+5V REG
19	1SS119	
20	SIB01-02	DC. STOPPER
21	RB406N	AC RECT
22	uPC574J	O.V.P
23	1SS119	DISCHARGE
24	RD10EB3T	+10V REG
25	1SS119	SW PROTECT
26	CR3CM-8	O.V.P
27	ERB81-004	CONV. DRIVE
28	ERB81-004	CONV. DRIVE
29	ERB81-004	CONV. DRIVE
30	ERB81-004	CONV. DRIVE
31	ERB44-06	
32	ERB44-06	

GB BOARD

Q1	2SA1048	O.V.P (-150V)
2	2SC2785	O.V.P (-150V)
3	2SA1048	O.V.P (+150V)
4	2SC2785	O.V.P (+150V)
5	2SA1048	O.V.P (+150V)
6	2SA1048	O.V.P ($+15\atop+18$V)
7	2SA1048	O.V.P ($+15\atop+18$V)
8	2SC2785	O.V.P ($+15\atop+18$V)
9	2SA1048	O.V.P ($-15\atop-18$V)
10	2SC2785	O.V.P ($-15\atop-18$V)
D1	1SS119	PROTECTOR
2	RD8.2ES-T1B2	REFERENCE
3	1SS119	PROTECTOR
4	1SS119	MIX.
5	1SS119	MIX.
6	RD8.2ES-T1B2	REFERENCE
7	TLR124	O.V.P INDICATE
8	1SS119	PROTECTOR
9	1SS119	PROTECTOR
10	TLR124	O.V.P INDICATE
11	RD8.2ES-T1B2	REFERENCE
12	1SS119	MIX.
13	1SS119	MIX.
14	1SS119	MIX.
15	1SS119	PROTECTOR
16	1SS119	PROTECTOR
17	RD8.2ES-T1B2	REFERENCE
18	1SS119	MIX.
19	1SS119	MIX.

5. DIAGRAMS
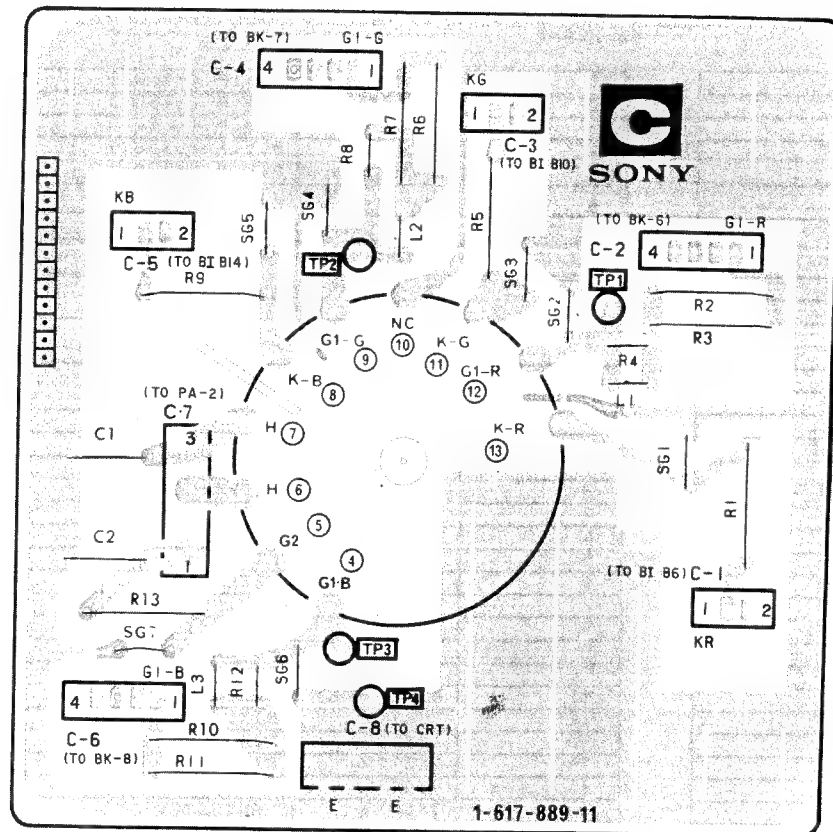
Model	BVM-1911 (NTSC)	BVM-2011P (PAL)
C84,89	0.47MF 20% 125V	0.47MF 20% 300V
C91,93	JW	0.0047 20% 400V
FUSE	4A 125V	T2A 250V

C board (CRT SOCKET)

PA board (HIGH VOLTAGE PROTECTOR)

IC			2 3				4		
Q			104 105 202	103 112 111	110 109		102	108 201	
D		106 220	206 207	204 205	202 203 111	219 250 251 110 109	215	104 102 105 216 217 218 201	103
TP	4 1			6 5		2	3		
RV									

PB board (FBT)
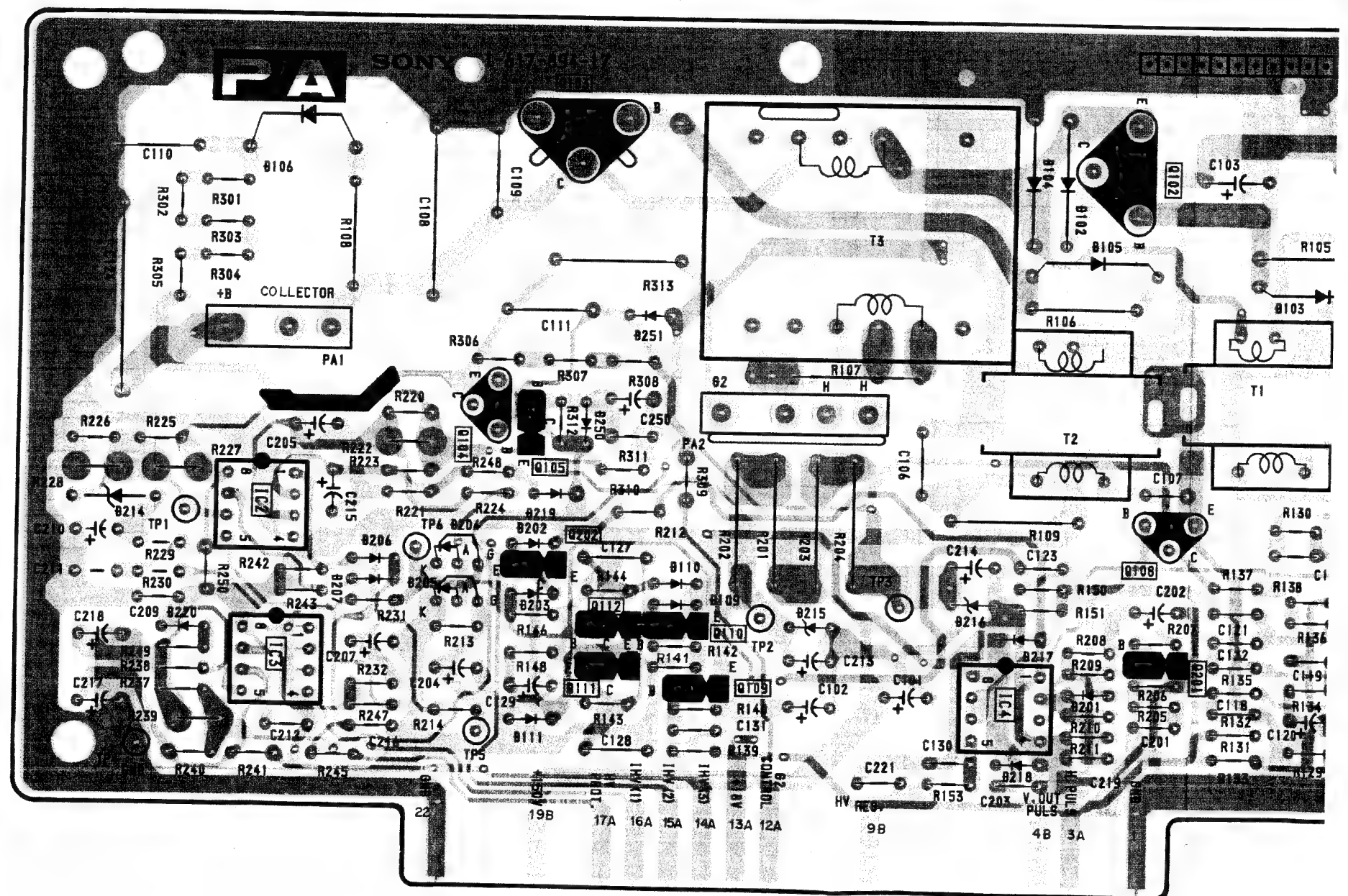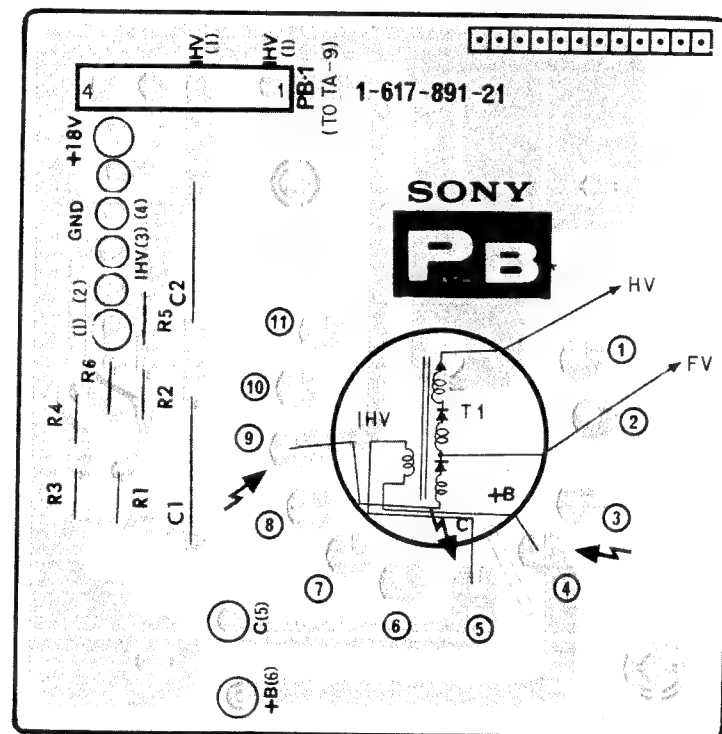
OTECTOR)
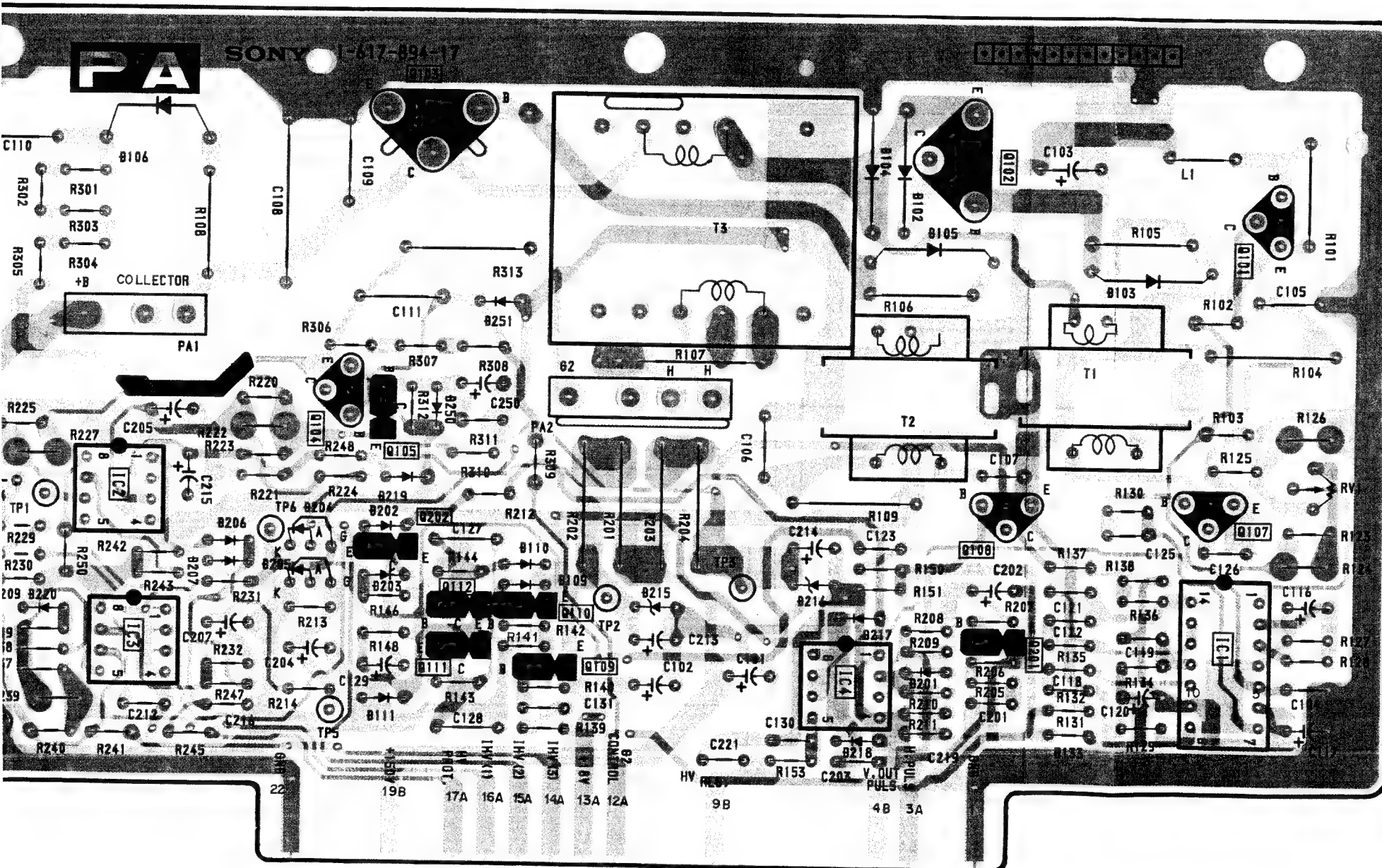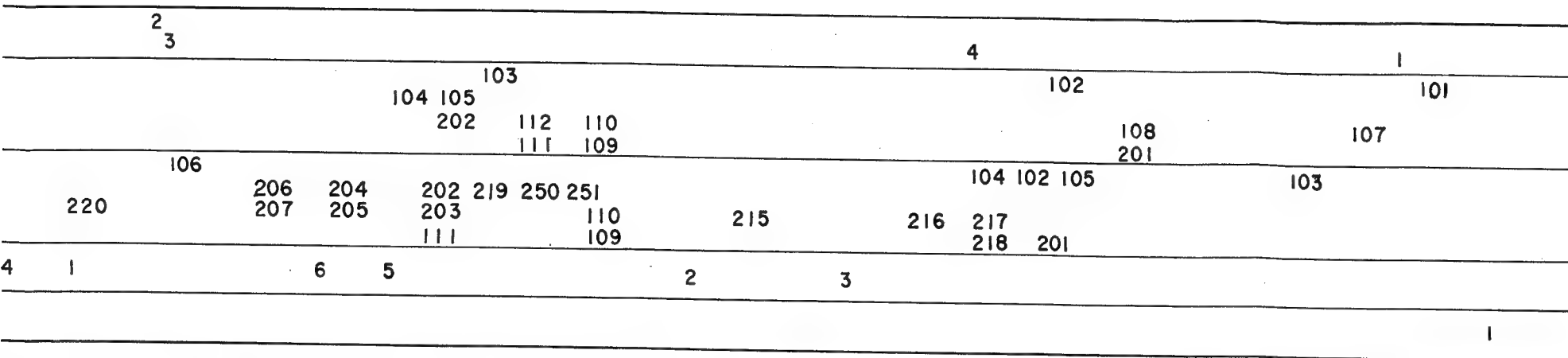
PA BOARD

IC1	uPC1394C	P.W.M CONTROL
2	NJM2903D	COMPARATOR
3	NJM2903D	COMPARATOR
4	TL082CP	BUFFER & COMPARATOR
Q101	2SA1142	O.V.P
102	2SC2555	DC-DC CONV.
103	2SD1556	HV CONV.
104	2SC3675	G2 REGULATOR
105	2SC3675	G2 REGULATOR
107	2SC2688	DC-DC CONV. DRIVE
108	2SC2688	HV CONV. DRIVE
109	2SA1175	HV CONV. DRIVE
110	2SC2785	HV CONV. DRIVE
111	2SC2785	HV CONV. DRIVE
112	2SC2785	HV CONV. DRIVE
201	2SC2785	CRT PROTECTOR
202	2SC2785	CRT PROTECTOR
D102	RU-1A	DC-DC CONV.
103	RU-1A	DC-DC CONV.
104	RU-1A	DC-DC CONV.
105	RU-1A	HV CONV. DRIVE
106	V11N	RECTIFIER
107	RD6.2EB2	G2 CONTROL
109	1SS119	HV CONV. DRIVE
110	1SS119	HV CONV. DRIVE
111	RD3.0ESB2	HV CONV. DRIVE
201	1SS119	PROTECTOR
202	RD3.9EB2	CRT PROTECTOR
203	1SS148	CRT PROTECTOR
204	CRO2AM	PROTECTOR
205	CRO2AM	PROTECTOR
206	1SS119	MIX
207	1SS119	MIX
214	HZ1A2L	HV. PROT
215	uPC574J	HV PROT. REF.
216	uPC574J	HV PROT. REF.
217	1SS119	PROT
218	1SS119	PROT
219	1SS119	PROT
220	1SS119	PROT
250		
251		

5-89

5-90

- [pattern] : Pattern from the side which enables seeing.
- [pattern] : Pattern of the rear side.

C board (CRT SOCKET)
PA board (HIGH VOLTAGE PROTECTOR)
PB board (FBT)

① 1,120Vp-p (H)

② 2.4Ap-p (H)

③ 64Vp-p (H)

④ 68Vp-p (H)

⑤ 61Vp-p (H)
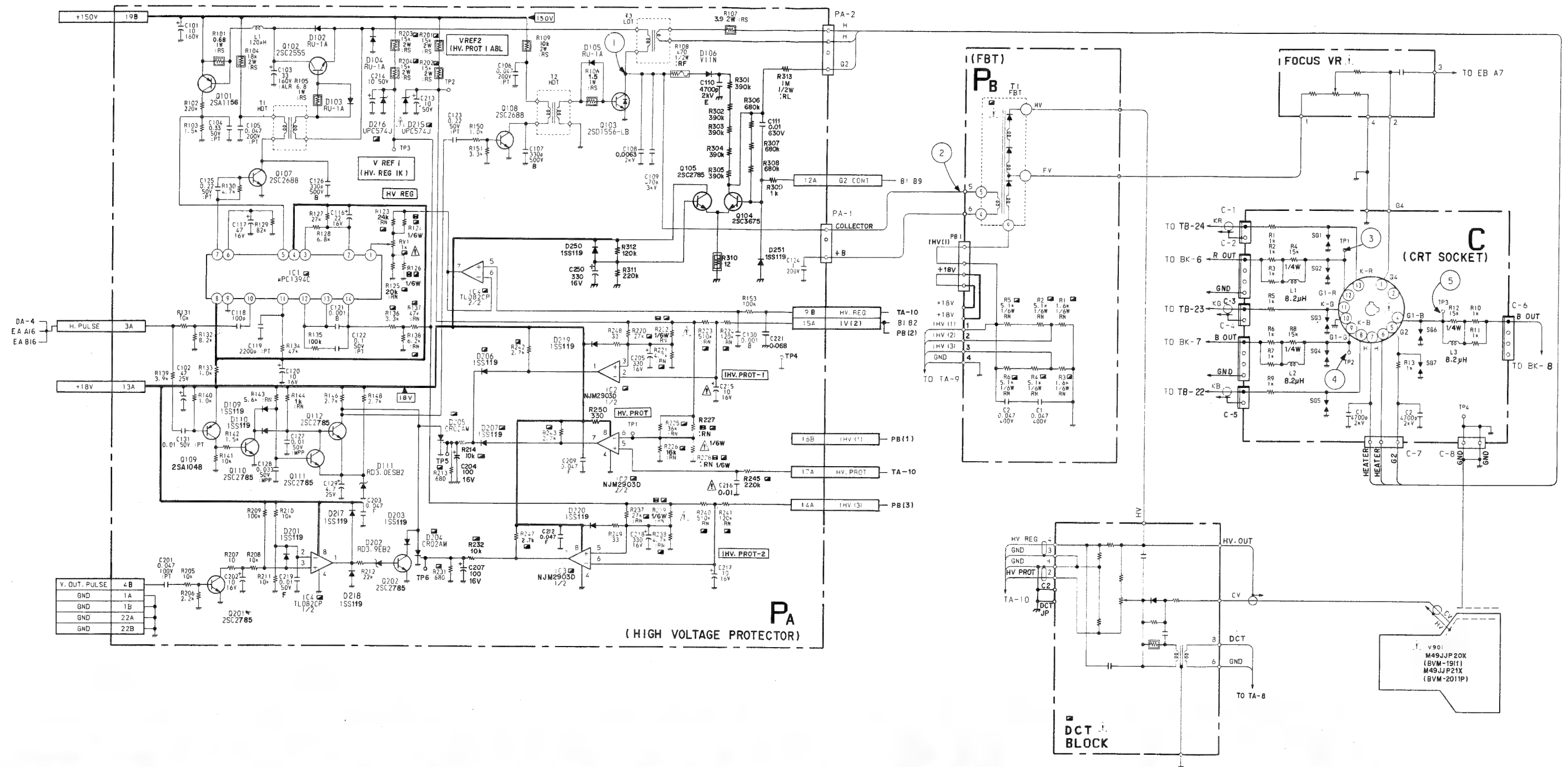
HA board (PANEL CONTROL), HH board (MANUAL VOLUME), HW board (MANUAL CONTROL),
HX board (INPUT SELECT), HY board (CONTROL FUNCTION SELECT), XB board (TALLY), Y board (POWER LED)

Y BOARD

D1	TLG124A	POWER INDICATOR

XB BOARD

D1	LT-9010H	TALLY LAMP
D2	LT-9010H	TALLY LAMP

HY BOARD

IC1	CX-7991	KEY SCAN	D35	TLY124	INDICATOR
2	CX-7991	KEY SCAN	36	TLY124	INDICATOR
3	CX-7991	KEY SCAN	37	TLY124	INDICATOR
			38	TLY124	INDICATOR
Q1	2SC2757	KEY DETECTION	39	MA110	PROTECTION
			40	MA110	PROTECTION
D1	MA110	PROTECTION	41	TLY124	INDICATOR
2	MA110	PROTECTION	42	TLY124	INDICATOR
3	MA110	PROTECTION	43	TLY124	INDICATOR
4	MA110	PROTECTION	44	TLY124	INDICATOR
5	MA110	PROTECTION	45	MA110	PROTECTION
6	MA110	PROTECTION	46	MA110	PROTECTION
7	MA110	PROTECTION	47	MA110	PROTECTION
8	MA110	PROTECTION	48	MA110	PROTECTION
9	MA110	PROTECTION	49	MA110	PROTECTION
10	MA110	PROTECTION	50	TLY124	INDICATOR
11	MA110	PROTECTION	51	TLY124	INDICATOR
12	MA110	PROTECTION	52	MA110	PROTECTION
13	TLY124	INDICATOR	53	MA110	PROTECTION
14	TLY124	INDICATOR	54	MA110	PROTECTION
15	TLY124	INDICATOR	55	MA110	PROTECTION
16	TLY124	INDICATOR	56	MA110	PROTECTION
17	TLY124	INDICATOR	57	MA110	PROTECTION
18	TLY124	INDICATOR	58	MA110	PROTECTION
19	TLY124	INDICATOR	59	MA110	PROTECTION
20	TLY124	INDICATOR	60	MA110	PROTECTION
21	TLY124	INDICATOR	61	MA110	PROTECTION
22	TLY124	INDICATOR	62	MA110	PROTECTION
23	TLY124	INDICATOR	63	MA110	PROTECTION
24	TLY124	INDICATOR	64	TLY124	INDICATOR
25	TLY124	INDICATOR	65	TLY124	INDICATOR
26	MA110	PROTECTION	66	TLY124	INDICATOR
27	MA110	PROTECTION	67	TLY124	INDICATOR
28	MA110	PROTECTION	68	TLY124	INDICATOR
29	MA110	PROTECTION	69	TLY124	INDICATOR
30	TLY124	INDICATOR			
31	TLY124	INDICATOR			
32	TLY124	INDICATOR			
33	TLY124	INDICATOR			
34	TLY124	INDICATOR			

HW BOARD

D101	TLR124	INDICATOR
102	TLR124	INDICATOR

HW board (MANUAL CONTROL)
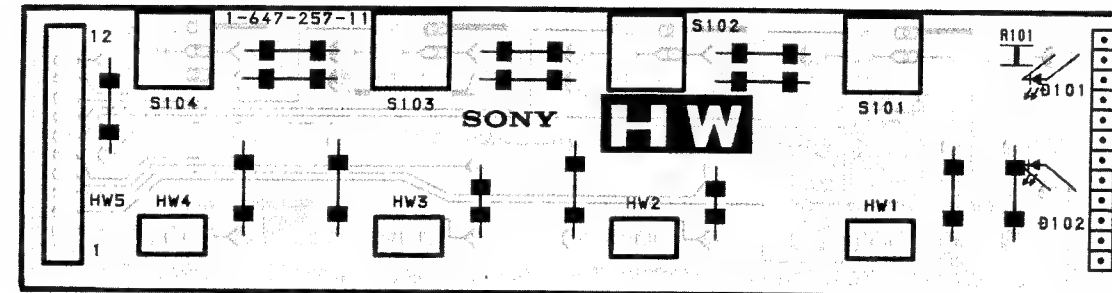
HX board (INPUT SELECT)
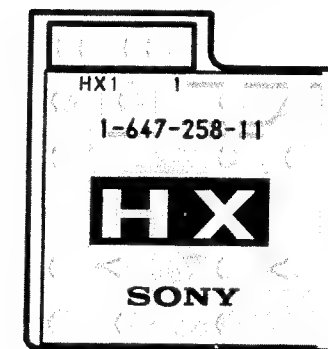
HH board (MANUAL VOLUME)

XB board (TALLY)
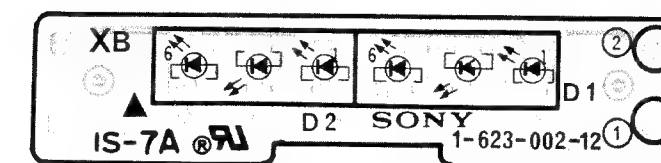
HA board (PANEL CONTROL)

Y board (POWER LED)

HX board (INPUT SELECT)

XB board (TALLY)
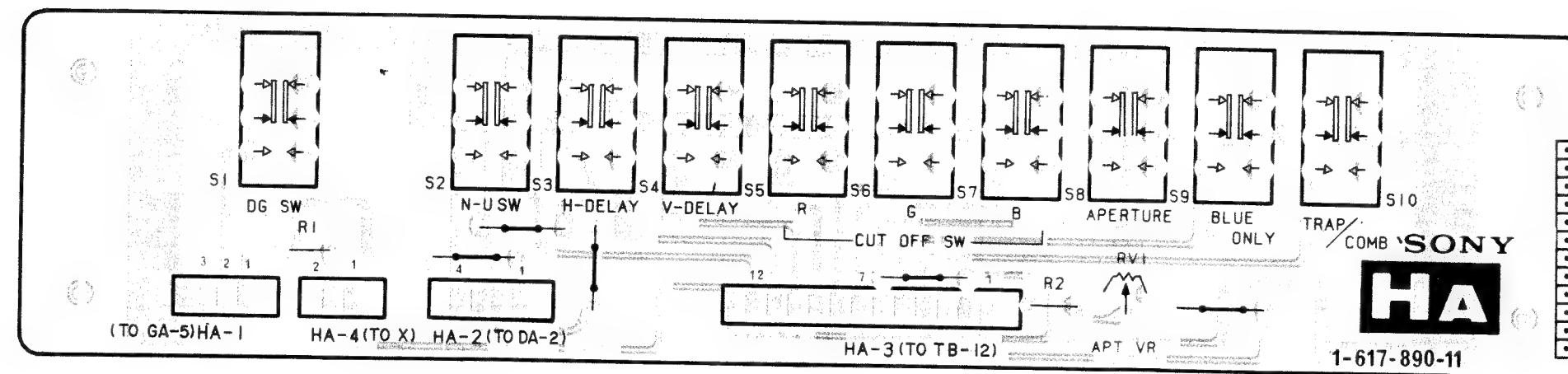
Y board (POWER LED)

HY board (CONTROL FUNCTION SELECT)

5. DIAGRAMS

• : Pattern from the side which enables seeing.
• : Pattern of the rear side.

HZ board (SYSTEM CONTROL)

5. DIAGRAMS
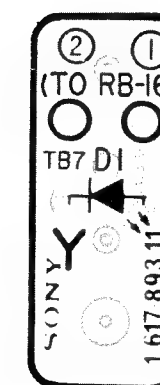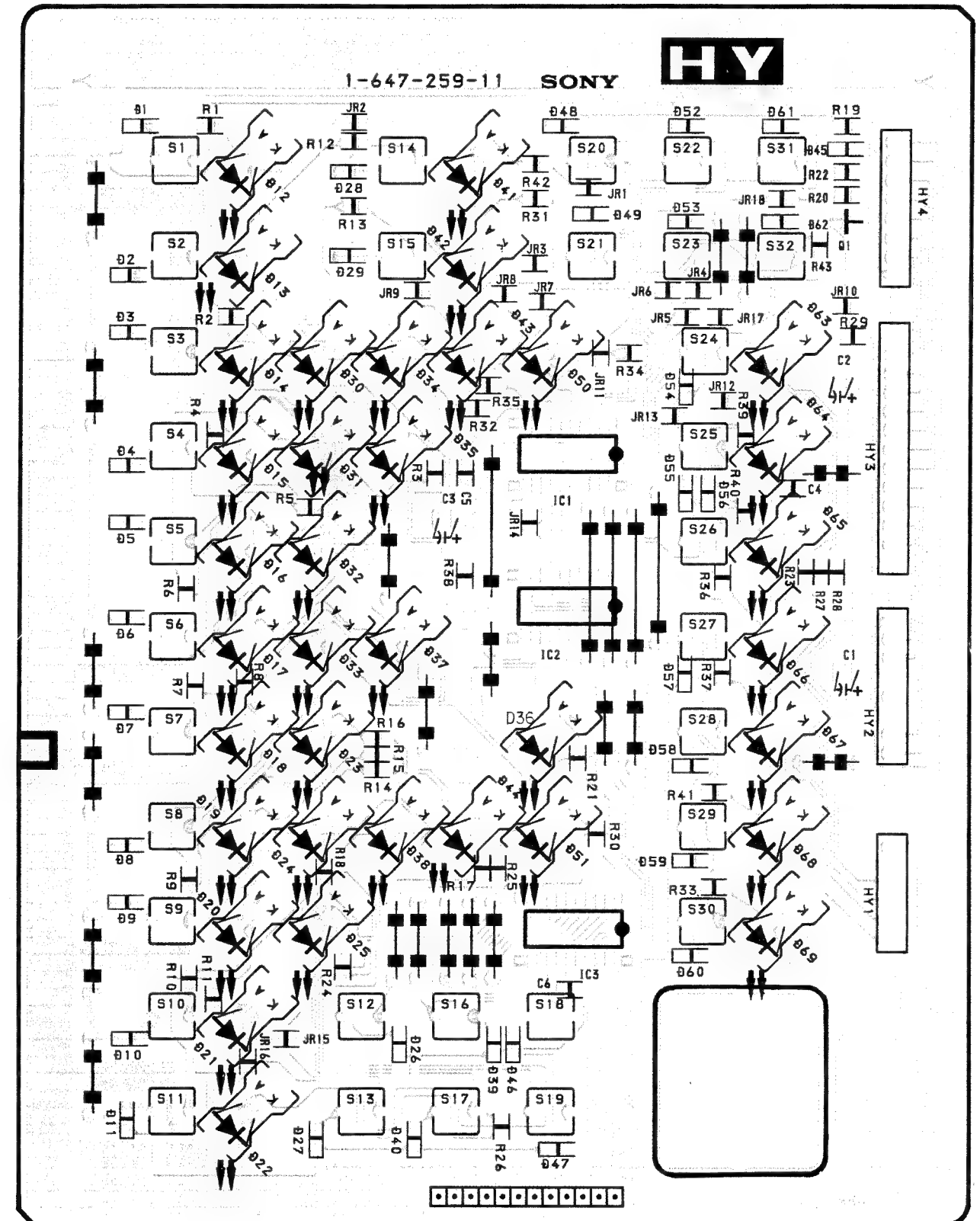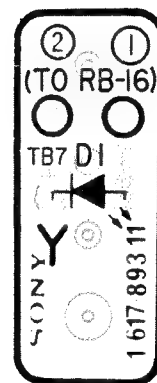
HZ BOARD

IC 1	SN75176BP	RECEIVER
2	SN75176BP	TRANSMITTER
3	X25040	NV RAM
4	PST529C	RESET
5	TL082M	OP AMP
6	uPD6142G-101	ON SCREEN D
7	TC74HCT02AF	NOR GATE
8	TC74HCT32AF	OR GATE
9	TC74HCT04AF	INVERTOR
10	TL082M	SAMPLE HOLD
11	TC74HCT139AF	DECODER
12	MC14051BF	DE-MULTIPLEXER
13	CXD10950	I/O EXPANDER
14	TL082M	SAMPLE HOLD
15	TC74HC299AF	SHIFT REGISTER
16	MC14051BF	DE-MULTIPLEXER
17	TC74HCT02AF	NOR GATE
18	TL082M	SAMPLE HOLD
19	TL082M	SAMPLE HOLD
20	DAC8043GP	D/A CONNECTOR
21	REF02EZ	REF. VOLTAGE
22	TL082M	SAMPLE HOLD
23	TL082M	SAMPLE HOLD
24	HD6475368CP-BVM	CPU
Q 2	DTC144EK	OUTPUT BUFFER
3	DTC144EK	OUTPUT BUFFER
4	DTC144EK	OUTPUT BUFFER
5	DTC144EK	OUTPUT BUFFER
6	DTC144EK	BUFFER
7	DTC144EK	OUTPUT BUFFER
8	DTC144EK	OUTPUT BUFFER
9	DTC144EK	OUTPUT BUFFER
10	DTC144EK	OUTPUT BUFFER
11	DTC144EK	OUTPUT BUFFER
12	DTC144EK	OUTPUT BUFFER
13	DTC144EK	OUTPUT BUFFER
14	DTC144EK	OUTPUT BUFFER
15	DTC144EK	OUTPUT BUFFER
16	DTC144EK	OUTPUT BUFFER
17	DTC144EK	OUTPUT BUFFER
18	DTC144EK	OUTPUT BUFFER
19	2SA1226	OUTPUT BUFFER
20	DTC144EK	OUTPUT BUFFER
21	DTC144EK	OUTPUT BUFFER
22	DTC144EK	OUTPUT BUFFER
23	DTC144EK	OUTPUT BUFFER
24	DTC144EK	OUTPUT BUFFER
25	DTC144EK	OUTPUT BUFFER
26	DTC144EK	OUTPUT BUFFER
27	DTC144EK	OUTPUT BUFFER
28	DTC144EK	OUTPUT BUFFER
29	DTC144EK	OUTPUT BUFFER
30	2SA1226	OUTPUT BUFFER
900	2SC1623	OUTPUT BUFFER
901	2SC1623	OUTPUT BUFFER
902	DTC144EK	OUTPUT BUFFER
903	DTC144EK	OUTPUT BUFFER
D 1	RD5.6ES-T1B	PROTECTION
2	RD5.6ES-T1B	PROTECTION
3	RD5.6ES-T1B	PROTECTION
4	RD5.6ES-T1B	PROTECTION
5	RD5.6ES-T1B	PROTECTION
6	RD5.6ES-T1B	PROTECTION
7	RD5.6ES-T1B	PROTECTION
8	RD5.6ES-T1B	PROTECTION
9	RD5.6ES-T1B	PROTECTION
10	RD5.6ES-T1B	PROTECTION
11	RD5.6ES-T1B	PROTECTION
12	RD5.6ES-T1B	PROTECTION
13	RD5.6ES-T1B	PROTECTION
14	RD5.6ES-T1B	PROTECTION
15	RD5.6ES-T1B	PROTECTION
17	1S2835	SWITCH
18	1S2837	SWITCH
19	1S2837	SWITCH
21	RD7.5M-T1B2	-7.5V REG
22	RD7.5M-T1B2	+7.5V REG

HZ
(SYSTEM CONTROL)
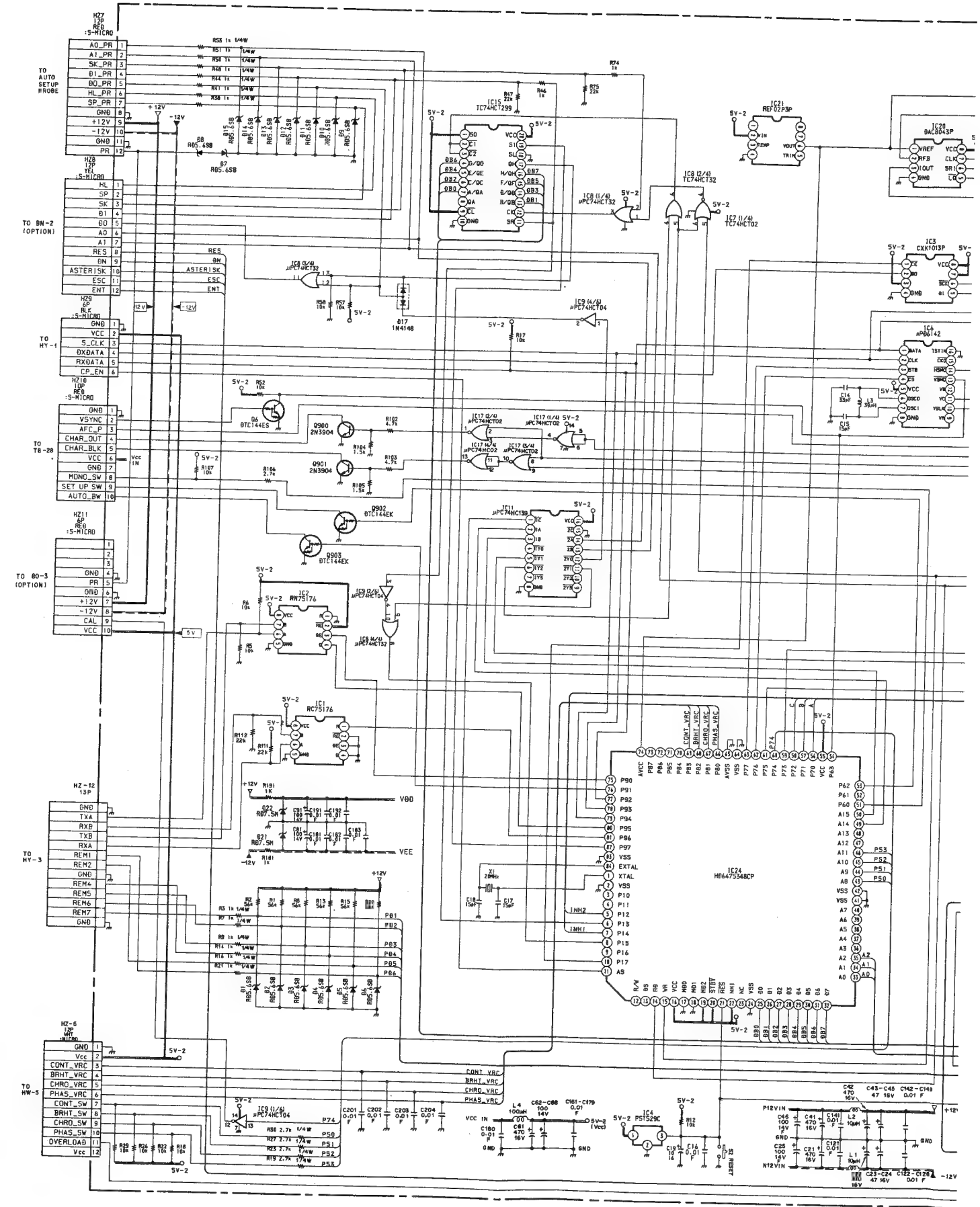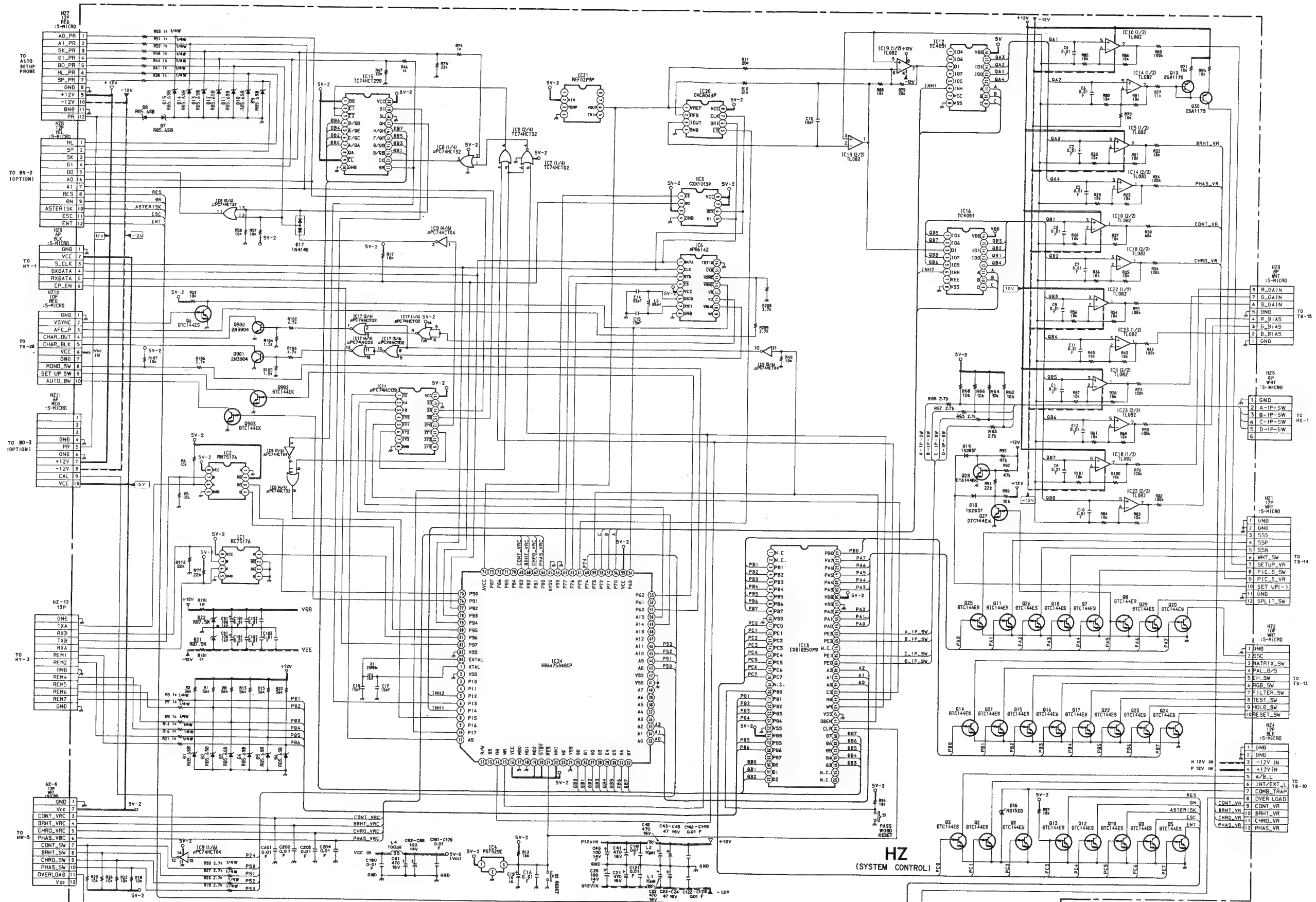
HZ board (SYSTEM CONTROL)

— CONDUCTOR SIDE —

IC	Q	D
	23 16	
	22 15 14	
16	9 10 13 17 21	16
	29 20	
	8	
	7	
13	18	
	26	
	11	
	25	
12 19		
		15
		14
		13
2		12
		11
21 20	1	10
		9
3		7 8	6 5 4 3 2 1
24		
		17
4	903	
	6 900 901 902	

5-101

— COMPONENT SIDE —

IC	Q	D
		18
	28,27	19 21
23 22 18	30 4 2 3 24	
	19 12 5	22
2 15		
		15
		14
		13
		12
1	20 21	11
		10
		9
3		6 7 8
24		5 4 3 2 1
	11 7	
	8 9	
4		20
17 6		

5-102
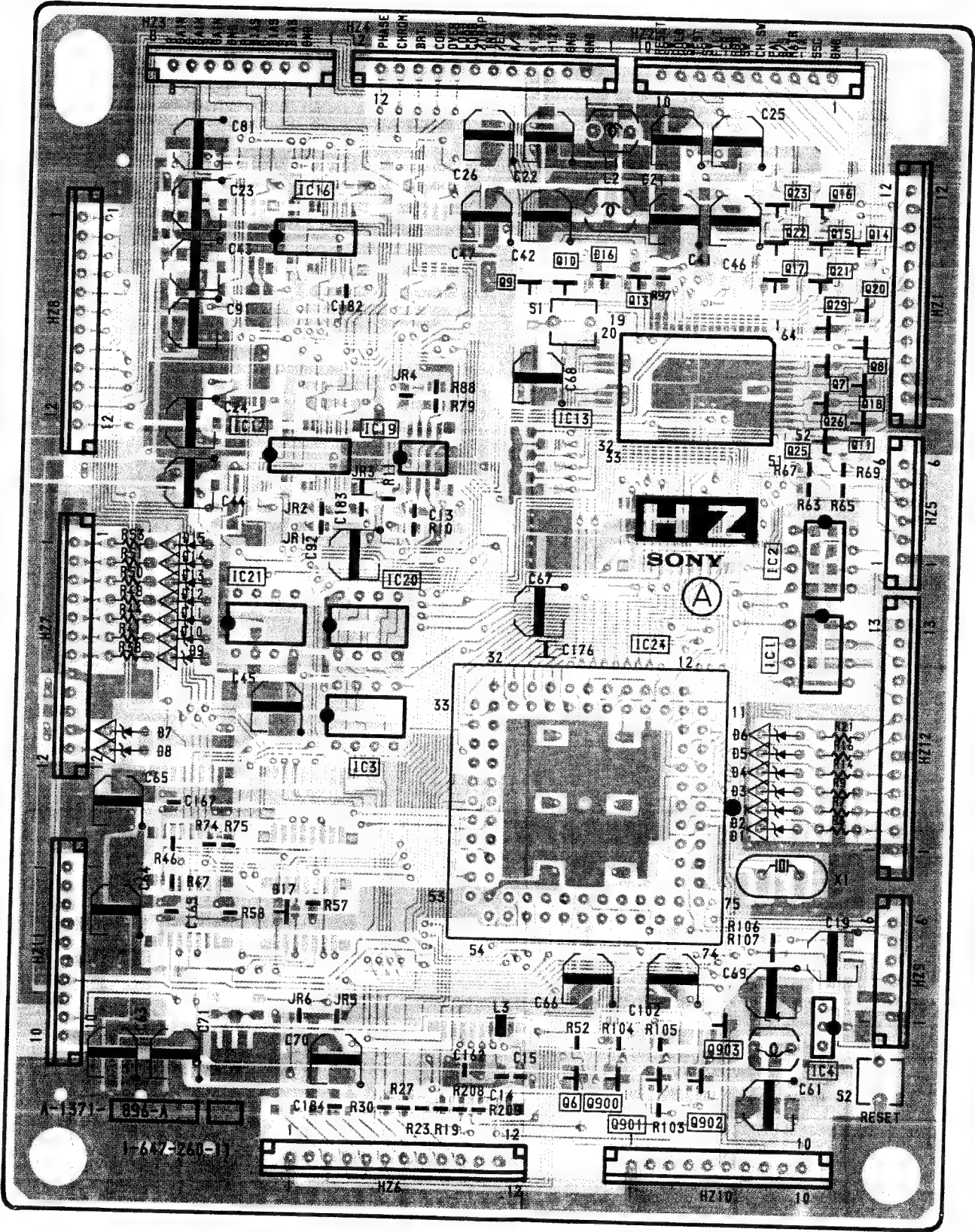
— COMPONENT SIDE —

IC	Q	D
		18
	28,27	19 21
23 22 18	30 4 2 3 24	
	19 12 5	22
14 10 5		
2 15		15
		14
		13
		12
		11
1	20 21	10
		9
3		6 7
		5 8
		4
24		3
	11 7	2
		1
	8 9	
4		20
17 6		

5-102

5-103

- .... : Pattern from the side which enables seeing.
- ▓▓▓▓ : Pattern of the rear side.

5. DIAGRAMS

QA board (COMPOSITE VIDEO INPUT)

W board (RGB/COMPONENT)

QB board (RGB/COMPONENT INPUT)

GC board (REG)

COMPOSITE VIDEO INPUT)

W board (RGB/COMPONENT)

W 1·627·678·11   SONY

W—5   2 1
W—4   2 1
W—3   2 1   R3
W—2   2 1   R2
W—1   2 1   R1

C3
C2
C1

QB board (RGB/COMPONENT INPUT)

V board (REMOTE)

SONY   QB   1·618·786·11

C12 C8 C9
C11 C5 C6
C10 C2 C3

S3   S F   R3   QB—3   1 2   (TO BA-6)
S2   S F   R2   QB—2   1 2   (TO BA-5)
S1   S F   R1   QB—1   1 2   (TO BA-4)

(159650911)   C7   C4   C1

R7
R6
R5
R4
R3
R2
R1
CP1   V1

V   SONY   1·627·677·12

GC board (REG)

617 885·12

GC-3   E
-150V
-12V
E
+12V

GC

SONY

GC-2

C18   GC-   -150V
C9   +15V
            -15V

C16
C8   C14   +12V   C7

C12   C2   C17

+15V   IC4   5V   +12V   IC3   5V -12V   IC2   5V   IC1

• [   ] : Pattern from the side which enables seeing.
• [   ] : Pattern of the rear side.

GC board (REG) QA board (COMPOSITE VIDEO INPUT)   QB board (RGB/COMPONENT INPUT)
V board (REMOTE) W board (RGB/COMPONENT)

GC BOARD

IC	1	uPD7912H	-12V REG
	2	uPD7912H	-12V REG
	3	uPD7812H	+12V REG
	4	uPD7812H	+12V REG
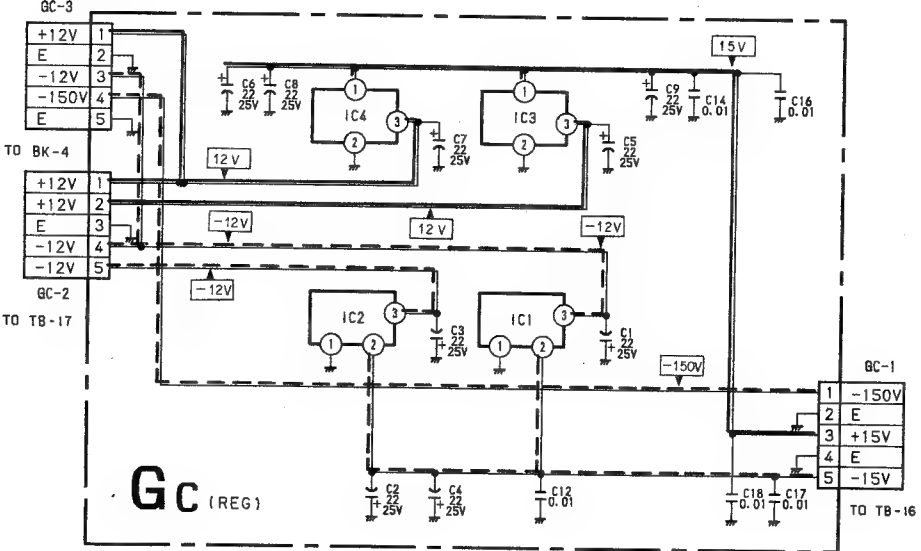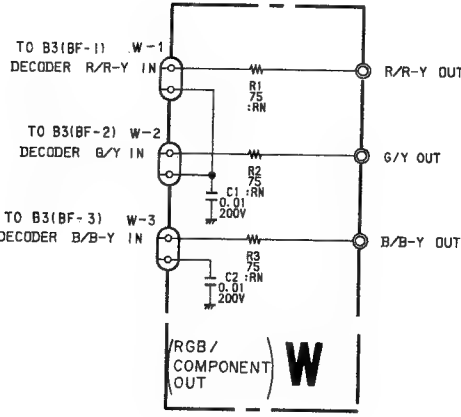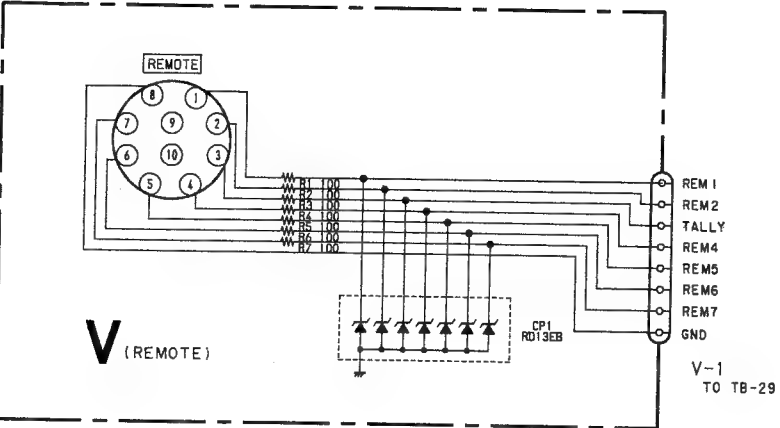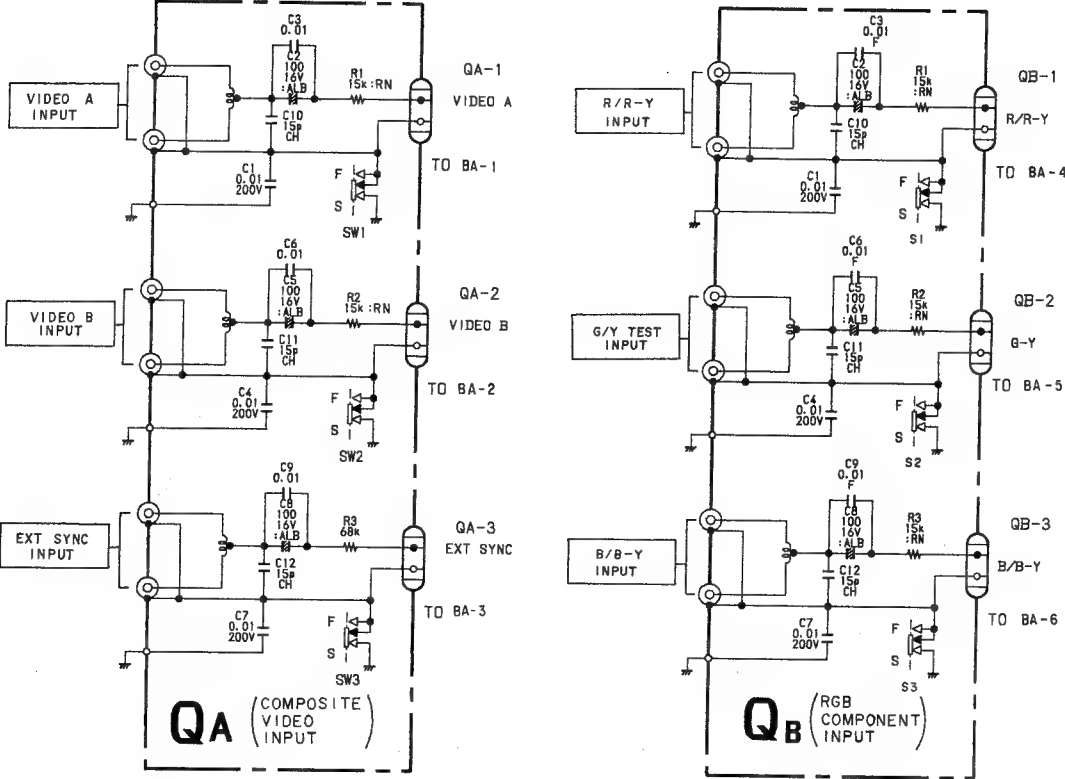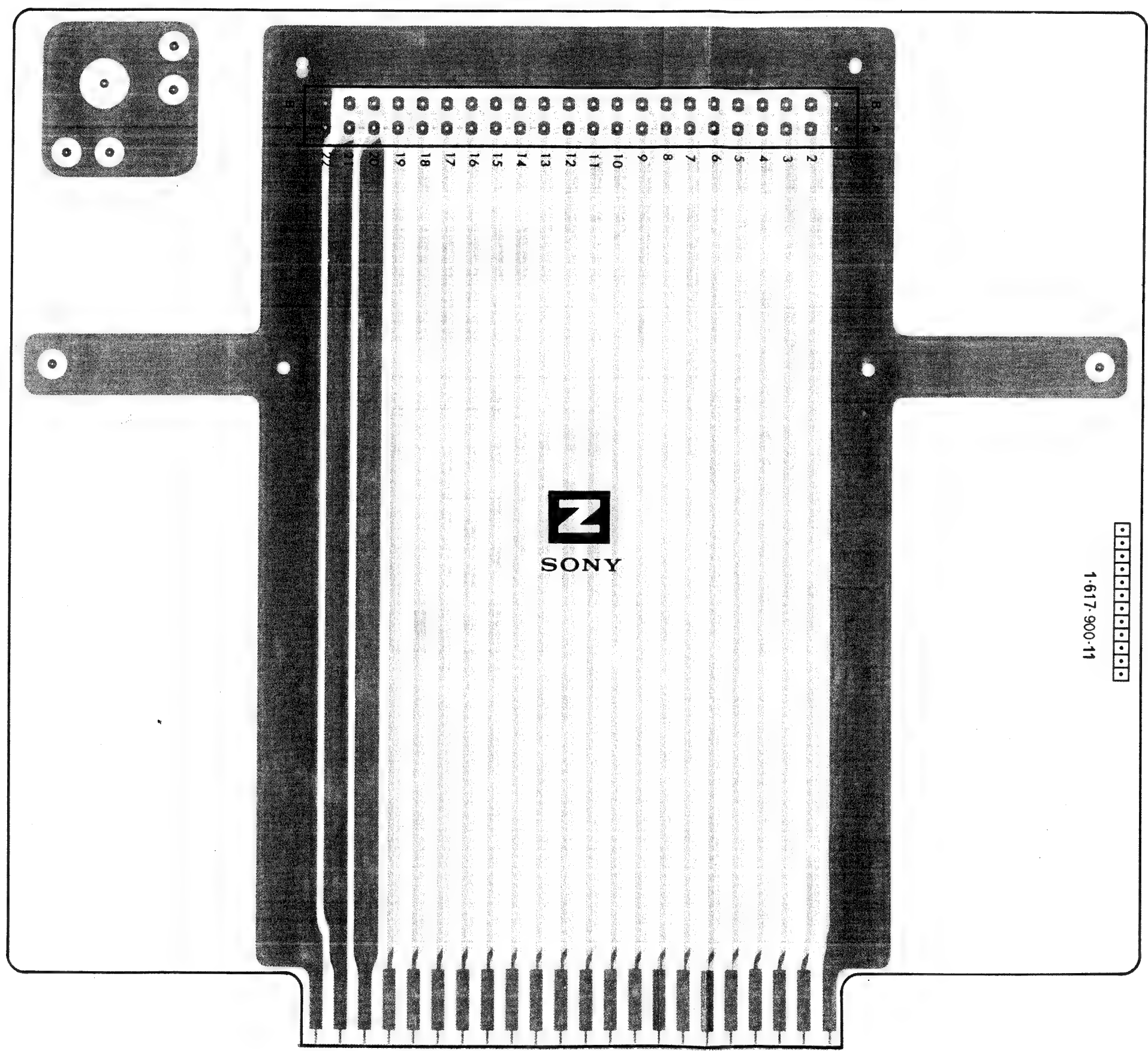
1·617·900·11

SONY

: Pattern from the side which enables seeing.

: Pattern of the rear side.

5-4. SEMICONDUCTORS

CX-158 (SONY)
HORIZONTAL DEFLECTION OSCILLATOR/FREQUENCY LIMITER
— TOP VIEW —

D.P ; DISCHARGE PROTECTION
F.L IN ; FREQUENCY LIMITER IN
H.F ADJ ; HORIZONTAL FREQUENCY ADJ
H.OSC OUT ; HORIZONTAL OSCILLATOR OUT
H.S IN ; HORIZONTAL SYNC IN
S.W IN ; SAW WAVE IN
T.C 1/2 ; TIME CONSTANT 1/2

CX20061 (SONY)
ANALOG SWITCH
— SIDE VIEW —

CONT.	SW
0	
1	

0 ; LOW LEVEL
1 ; HIGH LEVEL
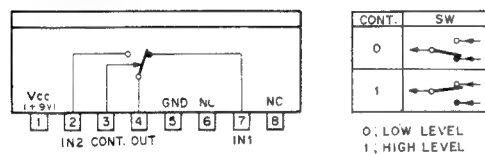
CX23025 (SONY)
C-MOS TV-VTR SYNC SIGNAL DISCRIMINATOR
— TOP VIEW —

A OUT ; SYNC SIGNAL DISCRIMINATION OUTPUT
B OUT ; SYNC SIGNAL DISCRIMINATION OUTPUT
H IN ; HORIZONTAL SYNC INPUT
SLCT ; POWER ON INITIALIZED SELECT INPUT
V IN ; VERTICAL SYNC INPUT
$\overline{V}$ IN ; VERTICAL SYNC INPUT

POWER ON INITIALIZED

SLCT INPUT	A OUTPUT	B OUTPUT
1	0	1
0	1	0

DISCRIMINATION

V SYNC INPUT FREQUENCY	OUTPUTS A	B
50Hz	0	1
60Hz	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

CX7991 (SONY)
C-MOS 12-BIT SERIAL TO PARALLEL CONVERTER
— TOP VIEW —

CLK : CLOCK
DATA : SERIAL DATA INPUT
P1-P12 : PARALLEL DATA
RESET : RESET SIGNAL
SET : SET SIGNAL
SO : SERIAL DATA OUTPUT
STB : STROBE SIGNAL

CX-718D (SONY)
SRG FET IC
— TOP VIEW —

※ R : 1.5KΩ

CX894 (SONY)
3 INPUT SWITCH
— SIDE VIEW —

CXA1539P

5-111
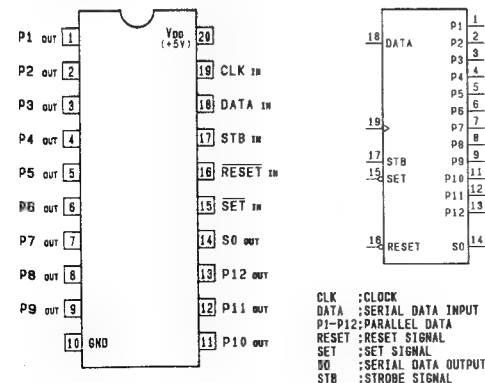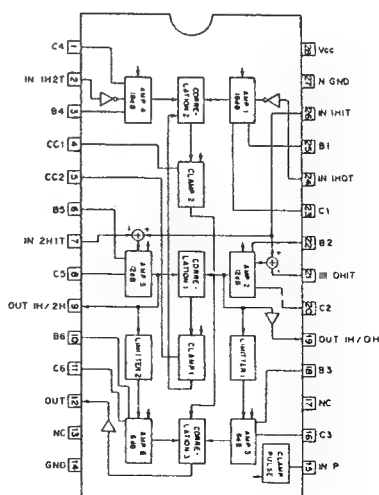
CXD1095Q (SONY) FLAT PACKAGE
C-MOS I/O PORT EXPANDER
— TOP VIEW —
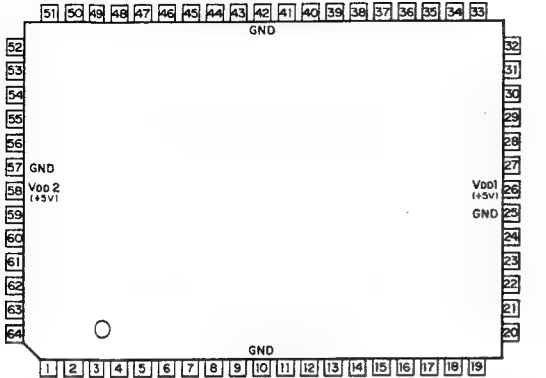
PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL
1			NC	17	O	O	PC6	33			NC	49	O	O	PX0
2			NC	18	O	O	PC7	34			NC	50	O	O	PX1
3	O	O	PB1	19			NC	35	O	O	D3	51			NC
4	O	O	PB2	20	O	O	PD0	36	O	O	D4	52	O	O	PX2
5	O	O	PB3	21	O	O	PD1	37	O	O	D5	53	O	O	PX3
6	O	O	PB4	22	O	O	PD2	38	O	O	D6	54	O	O	PA0
7	O	O	PB5	23	O	O	PD3	39	O	O	D7	55	O	O	PA1
8	O	O	PB6	24	O	O	PD4	40	O		CLR	56	O	O	PA2
9	O	O	PB7	25			GND	41	O		RST	57			GND
10			GND	26	O		VDD(+5V)	42			GND	58	O		VDD(+5V)
11	O	O	PC0	27	O	O	PD5	43	O		WR	59	O	O	PA3
12	O	O	PC1	28	O	O	PD6	44	O		RD	60	O	O	PA4
13	O	O	PC2	29	O	O	PD7	45	O		CS	61	O	O	PA5
14	O	O	PC3	30	O	O	D0	46	O		A0	62	O	O	PA6
15	O	O	PC4	31	O	O	D1	47	O		A1	63	O	O	PA7
16	O	O	PC5	32	O	O	D2	48	O		A2	64	O	O	PB0

CS	RD	WR	A2	A1	A0	MODE
0	0	1	0	0	0	PORT A → DATA BUS
0	0	1	0	0	1	PORT B → DATA BUS
0	0	1	0	1	0	PORT C → DATA BUS
0	0	1	0	1	1	PORT D → DATA BUS
0	0	1	1	0	0	PORT X → DATA BUS
0	0	1	1	0	1	———
0	0	1	1	1	0	———
0	0	1	1	1	1	———
0	1	0	0	0	0	DATA BUS → PORT A
0	1	0	0	0	1	DATA BUS → PORT B
0	1	0	0	1	0	DATA BUS → PORT C
0	1	0	0	1	1	DATA BUS → PORT D
0	1	0	1	0	0	DATA BUS → PORT X
0	1	0	1	0	1	———
0	1	0	1	1	0	DATA BUS → CTL REG.1
0	1	0	1	1	1	DATA BUS → CTL REG.2
1	X	X	X	X	X	DATA BUS ; HI-Z

O ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

D0–D7 ; DATA BUS INPUTS/OUTPUTS
CS ; CHIP SELECT INPUT
RD ; READ STROBE INPUT
WR ; WRITE STROBE INPUT
A0–A2 ; ADDRESS INPUT
RST ; RESET INPUT
CLR ; CLEAR INPUT
PA0–PA7 ; PORT A INPUTS/OUTPUTS
PB0–PB7 ; PORT B INPUTS/OUTPUTS
PC0–PC7 ; PORT C INPUTS/OUTPUTS
PD0–PD7 ; PORT D INPUTS/OUTPUTS
PX0–PX3 ; PORT X INPUTS/OUTPUTS

CXL1009P (SONY)
C-MOS CCD SIGNAL PROCESSOR FOR TBC
— TOP VIEW —
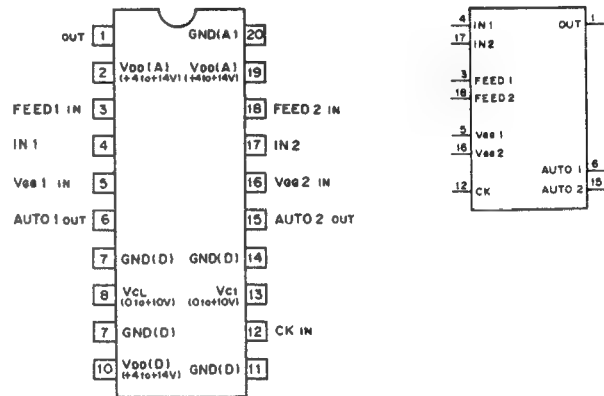
OUT ; OUTPUT
FEED 1/2 IN ; FEEDBACK INPUT 1/2
IN 1/2 ; INPUT 1/2
VGG 1/2 IN ; GATE INPUT 1/2
AUTO 1/2 OUT ; AUTO BIAS OUTPUT 1/2
CK IN ; CLOCK INPUT
VCL ; POWER SUPPLY 2 (DIGITAL)
VDD (A)/(D) ; POWER SUPPLY 1 (ANALOG)/(DIGITAL)
GND (A)/(D) ; GROUND (ANALOG)/(DIGITAL)
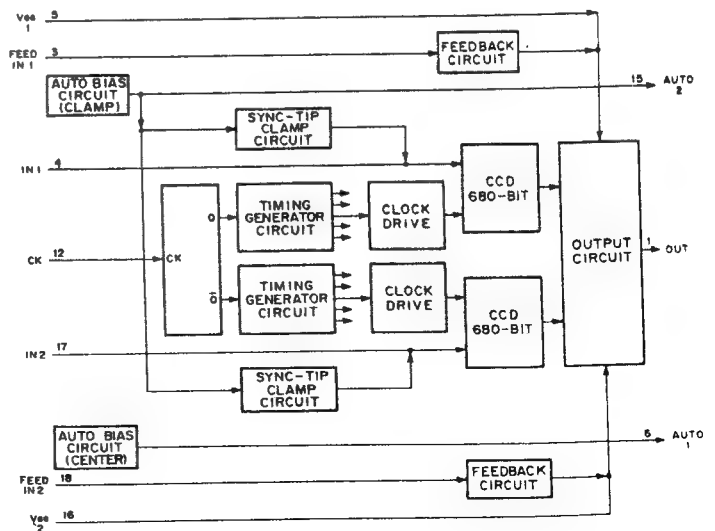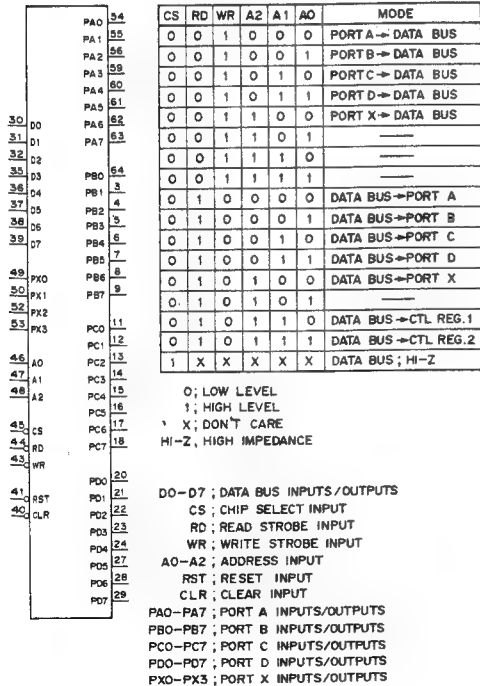
DAC-8043GP (PMI)
C-MOS 12-BIT SERIAL INPUT D/A CONVERTER
— TOP VIEW —

V REF	1	8	V DD
R PS	2	7	CK
I OUT	3	6	SRI
GND	4	5	LD
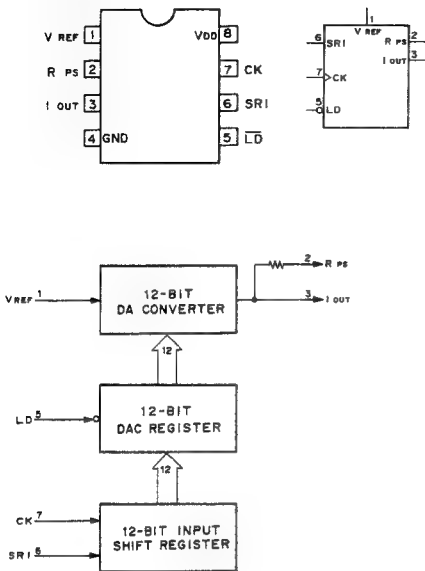
HD14011BP (HITACHI)
MC14011BCP (MOTOROLA)
TC4011BP (TOSHIBA)
uPD4011BC (NEC)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —

$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0: LOW LEVEL
1: HIGH LEVEL
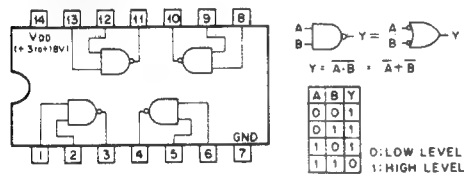
HD14538BP (HITACHI)
C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE
MONOSTABLE MULTIVIBRATOR
— TOP VIEW —

1·C	1	16	V DD
1·CR	2	15	2·C
1·RD	3	14	2·CR
1·CKP	4	13	2·RD
1·CKN	5	12	2·CKP
1·Q	6	11	2·CKN
1·Q̄	7	10	2·Q
GND	8	9	2·Q̄

OUTPUT PULSE WIDTH = CR

RETRIGGERABLE M.M.V

NON-RETRIGGERABLE M.M.V
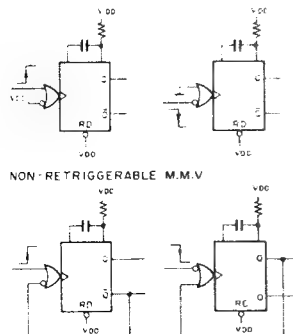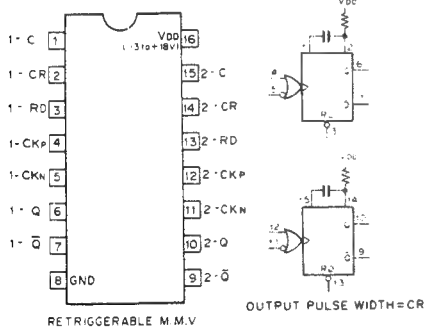
LA7016 (SANYO)
ELECTRONIC SWITCH
— SIDE VIEW —

CONT IN	ON
A	CHANNEL
O	SO
1	S1

0 ; LOW LEVEL
1 ; HIGH LEVEL
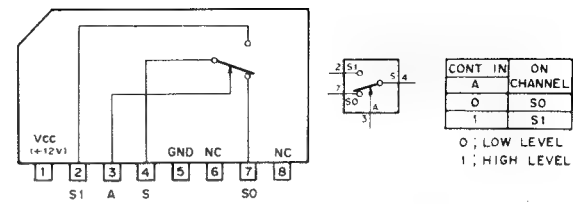
LM7812CT
XRA17809T
POSITIVE VOLTAGE REGULATOR (500mA)
— FRONT VIEW —

INPUT COMMON OUTPUT
(3)   (2)   (1)
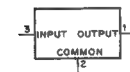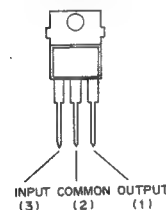
LM7912CT (NS) —12V
NEGATIVE VOLTAGE REGULATOR
— FRONT VIEW —

COMMON   INPUT OUTPUT
(3)   (2)   (1)
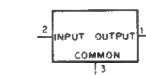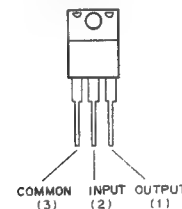
MC14001BCP (MOTOROLA)
uPD4001BC (NEC)
C-MOS 2-INPUT NOR GATE
— TOP VIEW —

$Y = \overline{A + B} = \overline{A} \cdot \overline{B}$

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0; LOW LEVEL
1; HIGH LEVEL
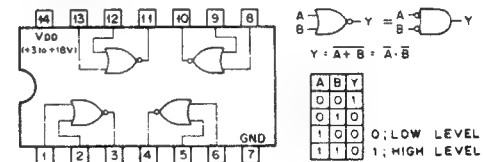
MC14023BCP (MOTOROLA)
TC4023BP (TOSHIBA)
C-MOS 3-INPUT NAND GATE
— TOP VIEW —

$Y = \overline{A \cdot B \cdot C} = \overline{A} + \overline{B} + \overline{C}$

A	B	C	Y
X	X	0	1
X	0	X	1
0	X	X	1
1	1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
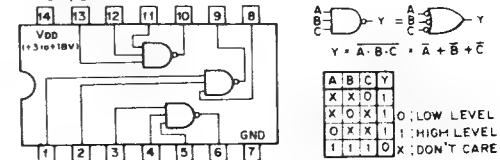
MB84027B (FUJITSU)
TC504027BP (TOSHIBA)
C-MOS J-K MASTER SLAVE FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —

DIRECT R-S FLIP FLOP		
Sd	Rd	Q
0	0	Qn
0	1	0
1	0	1
1	1	1

J-K FLIP FLOP		
tn		tn+1
J	K	Q
0	0	Qn
0	1	0
1	0	1
1	1	Q̄n

0 ; LOW LEVEL
1 ; HIGH LEVEL
CK ; tn ; BEFORE CLOCK
tn+1 ; AFTER CLOCK
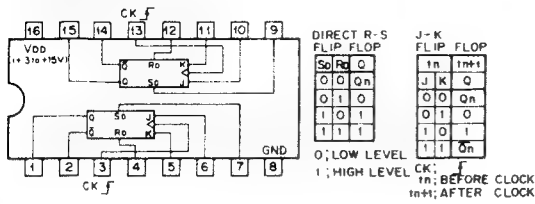
MC14027BCP (MOTOROLA)
C-MOS J-K MASTER SLAVE FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —

DIRECT R-S FLIP FLOP		
Sd	Rd	Q
0	0	Qn
0	1	0
1	0	1
1	1	1

J-K FLIP FLOP		
tn		tn+1
J	K	Q
0	0	Qn
0	1	0
1	0	1
1	1	Q̄n

0 ; LOW LEVEL
1 ; HIGH LEVEL
CK ; tn ; BEFORE CLOCK
tn+1 ; AFTER CLOCK

MC14040BCP (MOTOROLA)
TC4040BP (TOSHIBA)
C-MOS 12-STAGE RIPPLE CARRY BINARY COUNTER/DRIVER
— TOP VIEW —

COUNT	Q11	Q10	Q9	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	1	0
3	0	0	0	0	0	0	0	0	0	0	1	1
4095	1	1	1	1	1	1	1	1	1	1	1	1

RD	Q11 ...... Q0
1	ALL LOW
0	COUNT

0 ; LOW LEVEL
1 ; HIGH LEVEL
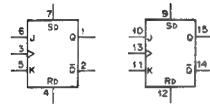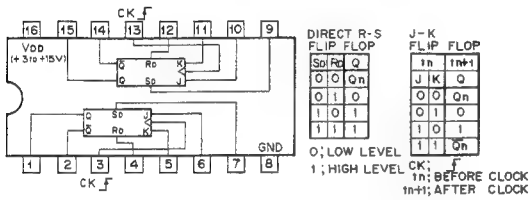
MC14051BF
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

VEE* ; VDD − VEE : + 3 to + 18 V

EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
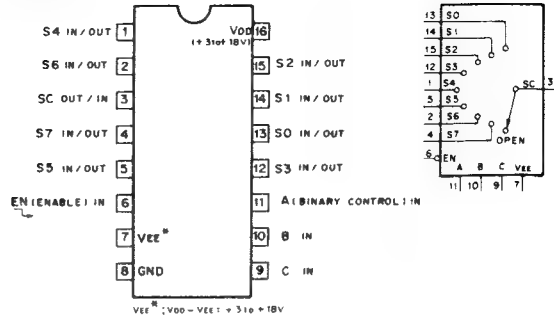
MC14053BCP (MOTOROLA)
TC4053BP
TC4053BPHB (TOSHIBA)
XRU4053BF
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

VEE* ; VDD − VEE : + 3 to + 18 V

CONT. INPUTS		ON
EN	A (X,Y,Z,)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

MC14066BCP
uPD4066BC
C-MOS BILATERAL ANALOG SWITCH
— TOP VIEW —

CONTROL	SWITCH
0	OFF
1	ON

0 ; LOW LEVEL
1 ; HIGH LEVEL
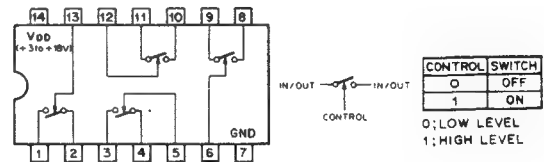
MC14069UBCP
uPD4069UBC (NEC)
C-MOS INVERTER
— TOP VIEW —

A —▷o— Y = A —▷— Y

Y = Ā

A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL
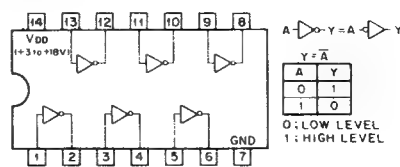
MC14071BCP (MOTOROLA)
TC4071BP (TOSHIBA)
uPD4071BC (NEC)
C-MOS 2-INPUT OR GATE
— TOP VIEW —

$Y = \dfrac{A}{B}$ $Y = \dfrac{A}{B}$

$Y = A + B = \overline{\overline{A} \cdot \overline{B}}$

A	B	Y	
0	0	0	
0	1	1	
1	0	1	0 ; LOW LEVEL
1	1	1	1 ; HIGH LEVEL
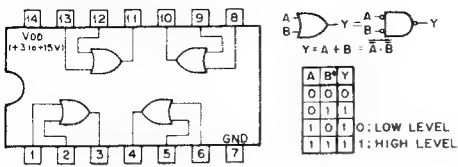
MC14073BCP (MOTOROLA)
TC4073BP (TOSHIBA)
uPD4073BC (NEC)
C-MOS 3-INPUT POSITIVE AND GATE
— TOP VIEW —

$Y = \dfrac{A}{B}$ $Y = \dfrac{A}{B}$

$Y = A \cdot B \cdot C = \overline{\overline{A} + \overline{B} + \overline{C}}$

A	B	C	Y
X	X	0	0
X	0	X	0
0	X	X	0
1	1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
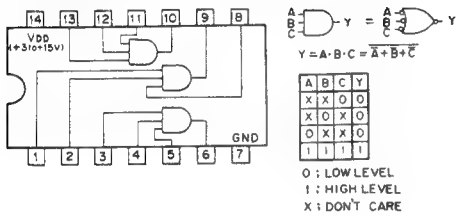
MC14081BCP (MOTOROLA)
TC4081BP (TOSHIBA)
uPD4081BC (NEC)
C-MOS 2-INPUT AND GATE
— TOP VIEW —

$Y = \dfrac{A}{B}$ $Y = \dfrac{A}{B}$

$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$

A	B	Y	
0	0	0	
0	1	0	
1	0	0	0 ; LOW LEVEL
1	1	1	1 ; HIGH LEVEL
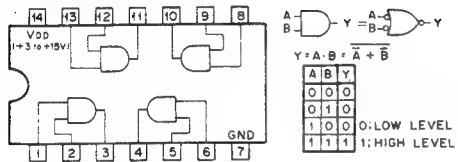
MC14093BCP
TC4093BP (TOSHIBA)
C-MOS 2-INPUT NAND SCHMITT TRIGGER
— TOP VIEW —

$Y = \dfrac{A}{B}$ $Y = \dfrac{A}{B}$

$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$

A	B	Y	
0	0	1	
0	1	1	
1	0	1	0 ; LOW LEVEL
1	1	0	1 ; HIGH LEVEL

(at VDD = 5V)

2.2 2.8V
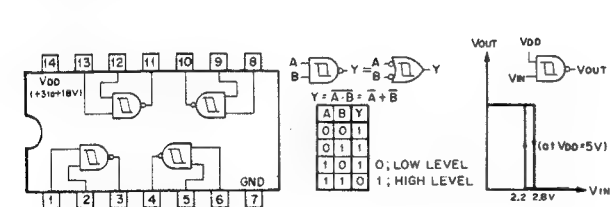
MC14175BCP (MOTOROLA)
TC40175BP (TOSHIBA)
C-MOS DECADE COUNTER/DIVIDER
— TOP VIEW —

RD IN	1		16	VDD (+3 to +18V)
Q1 OUT	2		15	Q4 OUT
$\overline{Q1}$ OUT	3		14	$\overline{Q4}$ OUT
D1 IN	4		13	D4 IN
D2 IN	5		12	D3 IN
$\overline{Q2}$ OUT	6		11	$\overline{Q3}$ OUT
Q2 OUT	7		10	Q3 OUT
GND	8		9	CKIN (CLOCK) IN

CK	D	RD	Q	$\overline{Q}$
⌐	0	1	0	1
⌐	1	1	1	0
L	X	1	Qo	$\overline{Qo}$
X	X	0	0	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
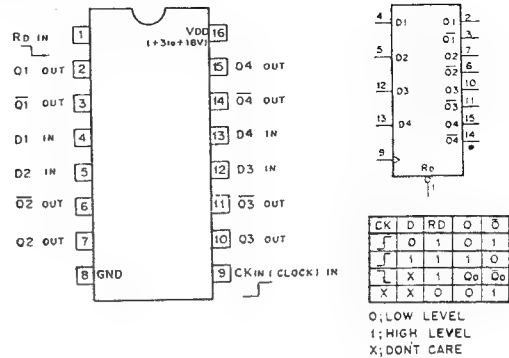
MC14520BCP (MOTOROLA)
TC4520BP (TOSHIBA)
C-MOS DUAL 4-BIT BINARY UP COUNTER
— TOP VIEW —

1-CK1 (1-CLOCK 1) IN	1		16	VDD (+3 to +18V)
1-CK2 (1-CLOCK 2) IN	2		15	2-RD (2-DIRECT RESET) IN
1-QA OUT	3		14	2-QD OUT
1-QB OUT	4		13	2-QC OUT
1-QC OUT	5		12	2-QB OUT
1-QD OUT	6		11	2-QA OUT
1-RD (1-DIRECT RESET) IN	7		10	2-CK2 (2-CLOCK 2) IN
GND	8		9	2-CK1 (2-CLOCK 1) IN

STATE	OUTPUTS QD QC QB QA			
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

CK1	CK2	RD	ACTION
⌐	1	0	INCREMENT COUNTER
0	⌐	0	INCREMENT COUNTER
L	X	0	NO CHANGE
X	⌐	0	NO CHANGE
⌐	0	0	NO CHANGE
1	⌐	0	NO CHANGE
X	X	1	QA THRU QD = 0

MC1496P (MOTOROLA)
BALANCED MODULATOR/DEMODULATOR
— TOP VIEW —

+SIG IN 1	VEE (−8V) 14
GAIN ADJ 2	NC 13
GAIN ADJ 3	12 −OUT
−SIG IN 4	NC 11
BIAS IN 5	10 −CAR IN
+OUT 6	NC 9
7 NC	8 +CAR IN

GAIN
+SIG 1 / +OUT 6
−SIG 4 / −OUT 12
+CAR 8 / −CAR 10 BIAS 5 / 2 3
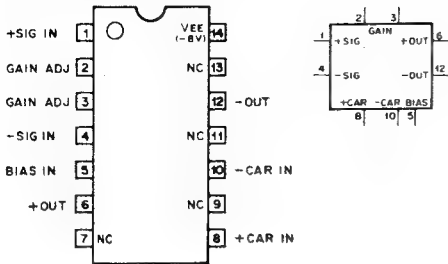
M5F78M12L (MITSUBISHI) +12V
POSITIVE VOLTAGE REGULATOR (500mA)
— PRINTED SIDE VIEW —

IN   GND   OUT

IN	OUT
GND	
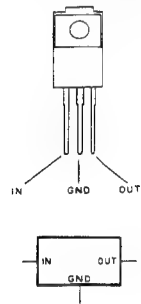
NJM2903D (JRC)
VOLTAGE COMPARATOR
— TOP VIEW —

8	7	6	5
Vcc (2 to 36V)			
			GND
1	2	3	4
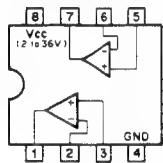
NJM4558
NJM4558S (JRC)
HIGH PERFORMANCE DUAL OPERATIONAL AMPLIFIER
— SIDE VIEW —

Vcc1 (+15V)   VEE (−15V)   Vcc2 (+15V)
1 2 3 4 5 6 7 8 9
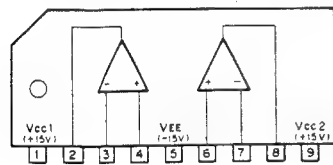
NJM4558D (JRC)
uPC4558C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —

1 (+15V) Vcc 8
2 / 7
3 / 6
4 VEE (−15V) 5
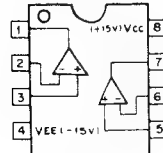
NJM7805FA
NJM7809FA
NJM7812FA
uPC7812H
POSITIVE VOLTAGE REGULATOR (1A)
— SIDE VIEW —

IN   COM (GND)   OUT
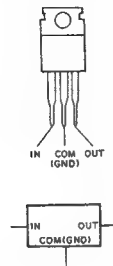
IN	OUT
COM(GND)	

PST529C (MITSUMI) Vs = 4.5V
VOLTAGE DETECTOR,SYSTEM RESET

(MITSUMI)

1 2 3

1 Vcc
3 OUT
2 GND
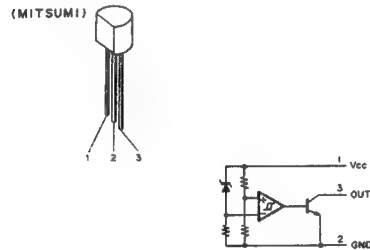
REF-02EZ (PMI)
REFERENCE/TEMPERATURE TRANSDUCER
— TOP VIEW —

1 NC	NC 8
VIN	NC 7
TEMPout 3	6 Vout
4 GND	5 TRIMin

2 VIN TMP 3
5 TRIM
GND Vout 6
4
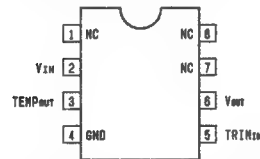
VIN   : INPUT VOLTAGE (+7V to +40V)
TEMPout : TEMPERATURE TRANSDUCER
          VOLTAGE OUTPUT (2.1mV/°C)
TRIMin : OUTPUT SIGNAL TRIMMING
Vout   : OUTPUT VOLTAGE (+5V)

SN75176BP (TI)
TTL-DIFFERENTIAL BUS TRANSCEIVER
— TOP VIEW —

1	Vcc (+5V) 8
2	7
3	6
4	GND 5

R 1 / 7 B
RE 2 / 6 A   INPUT/OUTPUT BUS PORT
DE 3
D 4
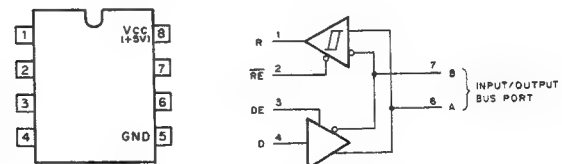
FUNCTION TABLE
— DRIVER —

INPUT	ENABLE	OUTPUT	
D	DE	A	B
1	1	1	0
0	1	0	1
X	0	HI-Z	HI-Z

— RECEIVER —

DIFFERENTIAL INPUTS	ENABLE	OUTPUT
A-B	RE	R
VID > 0.2V	0	1
−0.2V < VID < 0.2V	0	?
VID < −0.2V	0	0
X	1	HI-Z

1 : HIGH LEVEL
0 : LOW LEVEL
X : DON'T CARE
HI-Z : HIGH IMPEDANCE
? : INDETERMINATE

TA7812S
POSITIVE VOLTAGE REGULATOR (0.5A)
– SIDE VIEW –

IN COM OUT

IN OUT
COM(GND)
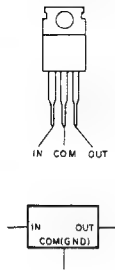
TA7193P (TOSHIBA)
TV CHROMA PROCESS (PAL)
– TOP VIEW –

G–Y out	1	24	R–Y out
B–Y in	2	23	B–Y out
R–Y in	3	Vcc (+12V) 22	
ALT PULSE in	4	21	BYPASS
OSC BIAS out	5	20	COLOR CONT
OSC in	6	19	CHROMA out
OSC in	7	18	UNICOLOR CONT
OSC out	8	17	BURST out
APC FILTER	9	16	ACC FILTER
APC FILTER	10	15	ACC AMP in
BURST in	11	14	BYPASS
	12 GND	13	BURST GATE in
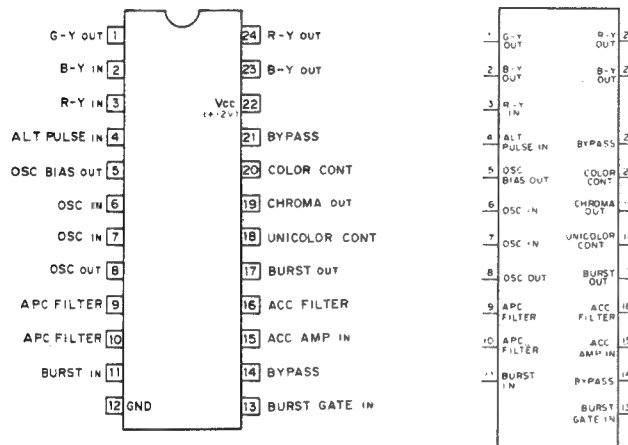
OUT ; OUTPUT
IN ; INPUT
CONT ; CONTROL
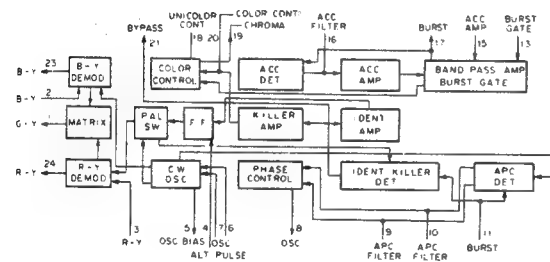
TC4030BP (TOSHIBA)
TC4030BPHB (TOSHIBA)
C·MOS EXCLUSIVE OR GATE
– TOP VIEW –
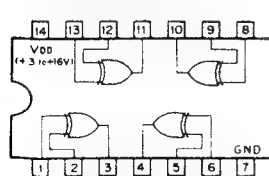
Y=A·B̄ + Ā·B

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TC74HC299FA
TTL 8-BIT UNIVERSAL SHIFT/STORAGE REGISTER
– TOP VIEW –

SO IN	1	Vcc (+5V) 20	
OE1 IN	2	19	S1 IN
OE2 IN	3	18	SL IN
G/QG I/O	4	17	QH OUT
E/QE I/O	5	16	H/QH I/O
C/QC I/O	6	15	F/QF I/O
A/QA I/O	7	14	D/QD I/O
QA OUT	8	13	B/QB I/O
RD IN	9	12	CK IN
10 GND		11	SR IN

SO ; FUNCTION SELECT 0
S1 ; FUNCTION SELECT 1
SL ; SHIFT LEFT
SR ; SHIFT RIGHT
OE1, OE2 ; OUTPUT ENABLE
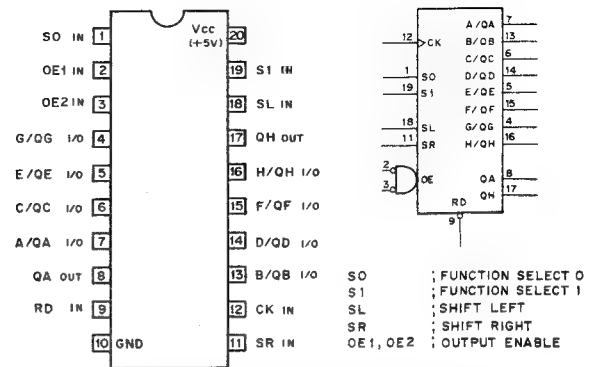
MODE	INPUTS							INPUTS/OUTPUTS								OUTPUTS	
	RD	CK	SO	S1	OE1	OE2	SL	SR	QA	QB	QC	QD	QE	QF	QG	QH	QA	QH
CLEAR	0	X	X	X	0	0	X	X	0	0	0	0	0	0	0	0	0	0
	0	X	X	X	0	0	X	X	0	0	0	0	0	0	0	0	0	0
HOLD	1	X	0	0	0	0	X	X	QAo	QBo	QCo	QDo	QEo	QFo	QGo	QHo	QAo	QHo
	1	0	X	X	0	0	X	X	QAo	QBo	QCo	QDo	QEo	QFo	QGo	QHo	QAo	QHo
SHIFT RIGHT	1	⌐	1	0	0	0	X	1	1	QAn	QBn	QCn	QDn	QEn	QFn	QGn	1	QGn
	1	⌐	1	0	0	0	X	0	0	QAn	QBn	QCn	QDn	QEn	QFn	QGn	0	QGn
SHIFT LEFT	1	⌐	0	1	0	0	1	X	QBn	QCn	QDn	QEn	QFn	QGn	QHn	1	QBn	1
	1	⌐	0	1	0	0	0	X	QBn	QCn	QDn	QEn	QFn	QGn	QHn	0	QBn	0
LOAD	1	⌐	1	1	X	X	X	X	a	b	c	d	e	f	g	h	a	h
OUTPUT ENABLE	X	X	X	X	1	X	X	X	HIGH-IMPEDANCE (INTERNAL LOGIC IS NOT AFFECTED)								QA	QH
	X	X	X	X	X	1	X	X									QA	QH

a---h=The level of the steady-state input at inputs A through H respectively
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC74HCT139AF
TTL 2-TO-4-LINE DECODER/DEMULTIPLEXER
– TOP VIEW –

1EN IN	1	Vcc (+5V) 16	
1A IN	2	15	2EN IN
1B IN	3	14	2A IN
1Y0 out	4	13	2B IN
1Y1 out	5	12	2Y0 out
1Y2 out	6	11	2Y1 out
1Y3 out	7	10	2Y2 out
8 GND		9	2Y3 out
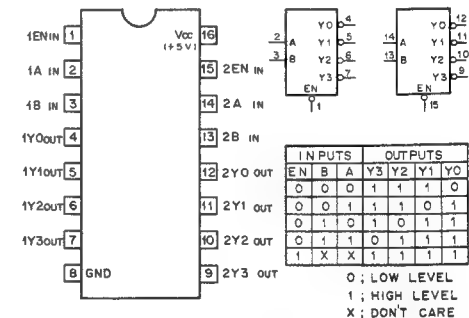
INPUTS			OUTPUTS			
EN	B	A	Y3	Y2	Y1	Y0
0	0	0	1	1	1	0
0	0	1	1	1	0	1
0	1	0	1	0	1	1
0	1	1	0	1	1	1
1	X	X	1	1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC74HCT02AF (TOSHIBA) FLAT PACKAGE
C-MOS QUAD 2-INPUT NOR GATES
– TOP VIEW –

Y=A̅+̅B̅ = Ā·B̄

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL
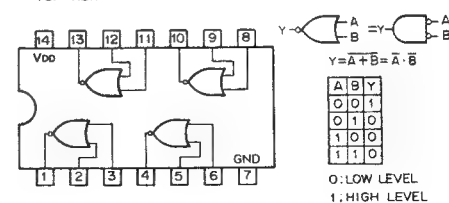
NOTE :

TYPE	Vdd
TC74AC02F	+2 to +5.5V
74ACT02SJ TC74ACT02F	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

TC74HCT04AF (TOSHIBA) FLAT PACKAGE

$A - \triangleright \!\circ - Y = A - \triangleright \!\!\triangleright - Y$

$Y = \overline{A}$

A	Y
0	1
1	0

0: LOW LEVEL
1: HIGH LEVEL
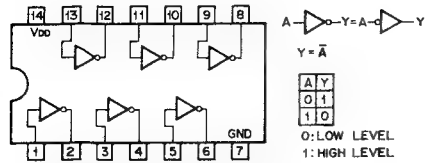
NOTE :

TYPE	V$_{DD}$
74HCT04 TYPE	+5V
TC74AC04 TYPE	+2 to +5.5V
74ACT04 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

TC74HCT32FA
TTL 2-INPUT POSITIVE-OR GATE
— TOP VIEW —

$\begin{array}{c} A \\ B \end{array} \!\!- \!\!\bigg) \!\! - Y = \begin{array}{c} A \\ B \end{array} \!\!- \!\!\bigg) \!\!\circ - Y$

$Y = A + B = \overline{\overline{A} \cdot \overline{B}}$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0: LOW LEVEL
1: HIGH LEVEL
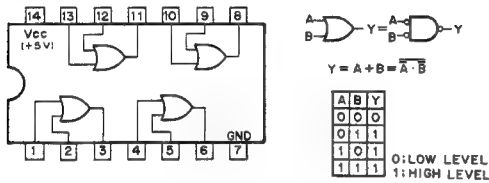
TL494CN (TI)
PWM POWER CONTROL
— TOP VIEW —

ERROR AMP-1(+) IN 1
ERROR AMP-1(-) IN 2
FEEDBACK OUT 3
DEAD-TIME CONT IN 4
CT IN 5
RT IN 6
GND 7
COLLECTOR-1 OUT 8
Vcc (+7 to +40V) 12

16 ERROR AMP-2(+) IN
15 ERROR AMP-2(-) IN
14 REF 5V REG OUT
13 OUTPUT CONT. IN
11 COLLECTOR-2 OUT
10 EMITTER-2 OUT
9 EMITTER-1 OUT

OUTPUT CONTROL	OUTPUT FUNCTION
0	PARALLEL
1	PUSH-PULL

0 ; GROUNDED
1 ; CONNECTED TO PIN 14
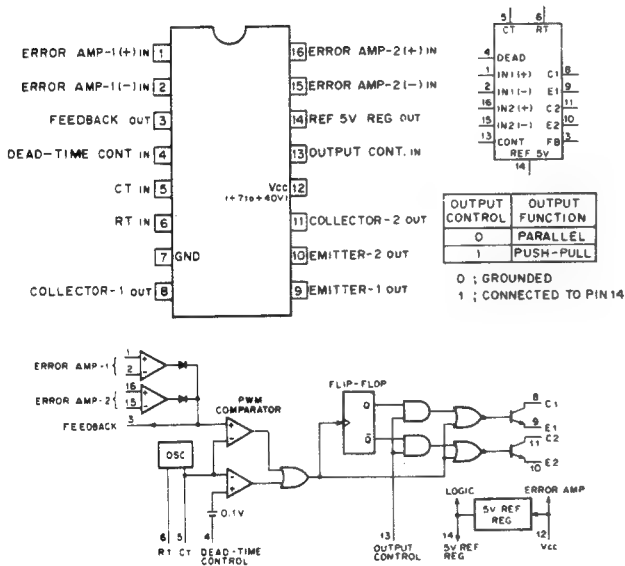
TL082ACP
TL082M
OPERATIONAL AMPLIFIER
(J FET-INPUT)
— TOP VIEW —
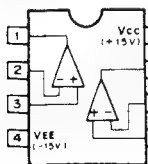
TL8608AP (TOSHIBA)
N-CH CCD ANALOG PROCESSING UNIT
— TOP VIEW —

TOP VIEW **TX-429M**
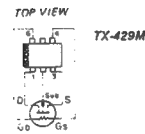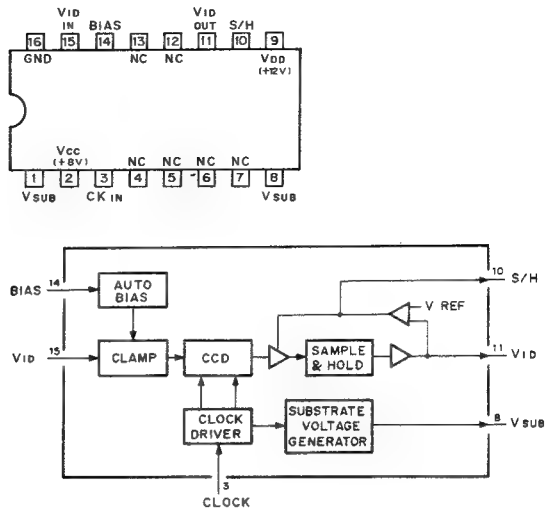
µPC1394C (NEC)
CONTROLLER OF SWITCHING MODE POWER SUPPLY
— TOP VIEW —
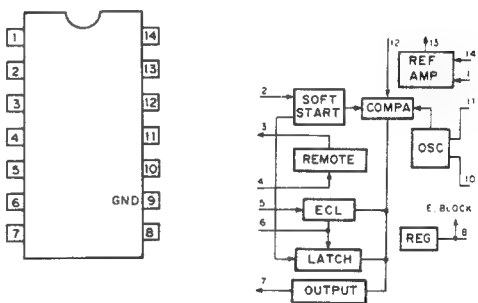
µPC78M12H (NEC)
POSITIVE VOLTAGE REGULATOR (0.5A)
— SIDE VIEW —

OUTPUT VOLTAGE	uA78M??UC	FS78??M	uPC78M??H	L78M??	HA178M??P
+5V	uA78M05UC	FS7805M	uPC78M05H	L78M05	HA178M05P
+6V	uA78M06UC	-------	---------	------	HA178M06P
+7V	--------	-------	---------	------	HA178M07P
+8V	uA78M08UC	-------	uPC78M08H	------	HA178M08P
+12V	uA78M12UC	FS7812M	uPC78M12H	------	HA178M12P
+15V	uA78M15UC	FS7815M	uPC78M15H	------	HA178M15P
+18V	--------	-------	---------	------	HA178M18P
+20V	uA78M20UC	-------	---------	------	HA178M20P
+24V	uA78M24UC	FS7824M	uPC78M24H	------	HA178M24P

OUTPUT VOLTAGE	AN78M??
+5V	AN78M05
+6V	AN78M06
+7V	AN78M07
+8V	AN78M08
+9V	AN78M09
+10V	AN78M10
+12V	AN78M12
+15V	AN78M15
+18V	AN78M18
+20V	AN78M20
+24V	AN78M24

uPC79M12H
NEGATIVE VOLTAGE REGULATOR (0.5A)
— SIDE VIEW —

COMMON IN OUT

IN OUT
COM(GND)
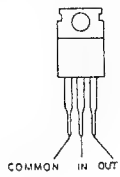
uPC7912H (NEC)
NEGATIVE VOLTAGE REGULATOR (1A)
— SIDE VIEW —

COM
(GND) OUTPUT
INPUT

COM(GND)
IN OUT
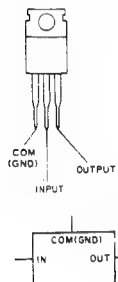
OUTPUT VOLTAGE	AN79??	FS79??	uA79??UC	uPC79??H	MC79??CT
−2V	------	------	--------	--------	MC7902CT
−5V	AN7905	FS7905	uA7905UC	uPC7905H	MC7905CT
−5.2V	------	------	--------	--------	MC7905.2CT
−6V	AN7906	------	uA7906UC	--------	MC7906CT
−7V	AN7907	------	--------	--------	--------
−8V	AN7908	------	uA7908UC	uPC7908H	MC7908CT
−9V	AN7909	------	--------	--------	--------
−10V	AN7910	------	--------	--------	--------
−12V	AN7912	------	uA7912UC	uPC7912H	MC7912CT
−15V	AN7915	------	uA7915UC	uPC7915H	MC7915CT
−18V	AN7918	------	uA7918UC	uPC7918H	MC7918CT
−20V	AN7920	------	--------	--------	--------
−24V	AN7924	------	uA7924UC	uPC7924H	MC7924CT

UPD6142G-101 (NEC) FLAT PACKAGE
C-MOS 8-BIT SERIALL INPUT CHARACTER DISPLAY
— TOP VIEW —

DATA IN 1   16 TEST IN
CLK IN 2   15 CK OUT
STB IN 3   14 H SYNC IN
$\overline{CS}$ IN 4   13 V SYNC IN
5 VDD(+5V)   12 VB OUT
OSC OUT 6   11 VG OUT
OSC IN 7   10 V BLK OUT
8 GND   9 VR OUT

1 D   VR 9
             VG 11
14 H SYNC   VB 12
13 V SYNC
2   V BLK 10
7 OSC IN
6 OSC OUT   CK OUT 15
3 STB
4 CS
16 TEST
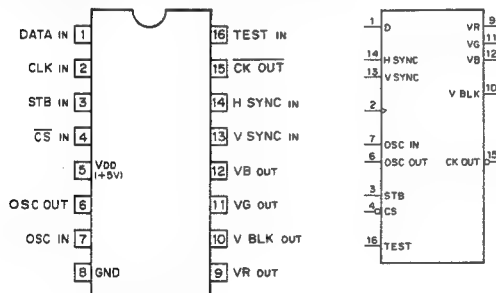
D; DATA INPUT
CK OUT; EQUAL TO OUTPUT OF OSC OUT
CLK; CLOCK INPUT
CS; CHIP SELECT INPUT
H SYNC; H SYNC INPUT
OSC IN, OUT; EXTERNAL TERMINAL FOR OSC
STB; STROBE INPUT
TEST; TEST CLOCK INPUT
VB; BLUE CHARACTER DATA OUTPUT
V BLK; V BLANKING OUTPUT
VG; GREEN CHARACTER DATA OUTPUT
VR; RED CHARACTER DATA OUTPUT
V SYNC; V SYNC INPUT

5-119
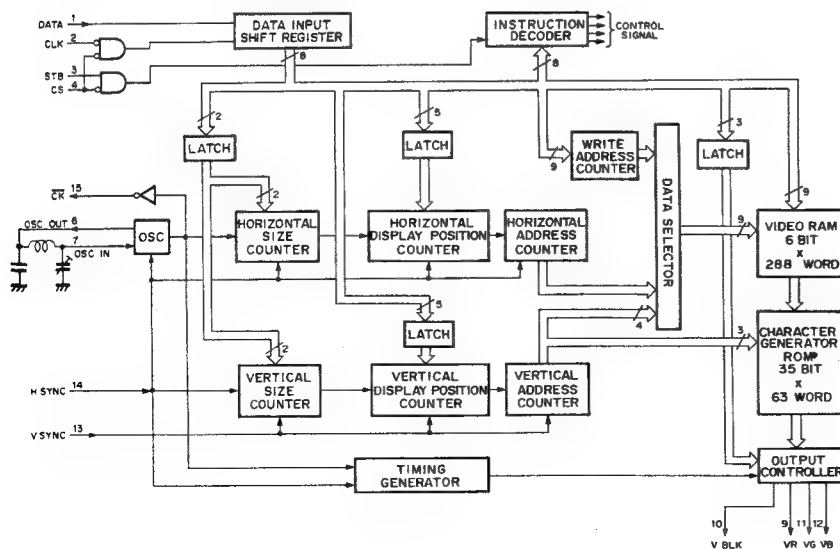
2SA733
2SA844
2SA1091
2SC2551
2SC2878
2SC3068

E C B

2SA812
2SA1162
2SA1226
2SC1623
2SC2757
2SC3624A
DTA144EK
DTC144EK

2SA979
2SA1306

B C E C B

2SA1048
2SA1115
2SC2688
2SC403SP
DTA124ES
DTA144ES
DTC124ES
DTC143TS
DTC144ES
XDA124ES
XDA144ES
XDC124ES
XDC144ES

2SA1142
2SA1406
2SA1407
2SC3600

2SA1175
2SC2785

E C B

2SA1488

2SB734
2SD774

E C B

2SB858
2SB861
2SC3675
2SD1134

B C E

2SC2555

B C E
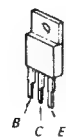
2SC2688
2SC2752
2SC3209
2SC3298
2SD669A

letter side

E C B
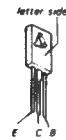
2SD1556

2SC3851

2SD789

E C B

2SK381
2SK514

D G S

2SK523

D S G

1S2835
1S2836
1S2837
MA152WK

1SS119
1S83
WG713A
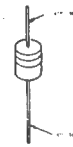
1SS148
10E2
GP08D
RD10EB
RD12EB
RD15EB
RD15ES
RD3.0EB
RD3.9EB
RD3.9ES
RD4.3EB
RD5.6EB
RD5.6ES
RD6.2EB
RD6.8EB
RD6.8ES
RD7.5ES
RD8.2ES
RD9.1EB
RD9.1ES
RU-3AM

1T25

cathode

anode

CR02AM-4
CR02AM-8

gate anode cathode

CR3CM-8

anode

cathode   gate
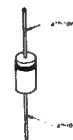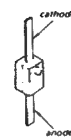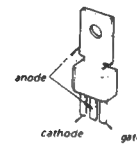
CTU-38R
CTU-38S
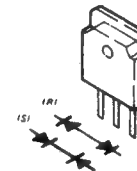
ERB44-06
ERB81-004
ERC04-24S
ERD28-04S
ERD28-08S
RH-1
RH-1A
RU-1A
RU-1C
SIB01-02

ESAC25-04C

anode
cathode   anode
cathode
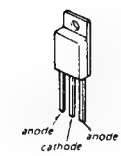
ESAC25-04D
ESAC25-04N

ESAC31-02D
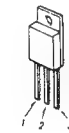
LT9010H
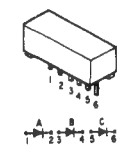
MC911

MC921

MC932

V11N

cathode

anode
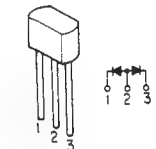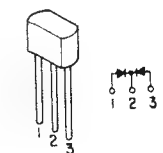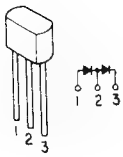
RB406N
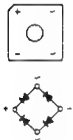
RD5.6M
RD7.5M

S3WB60Z

Marking
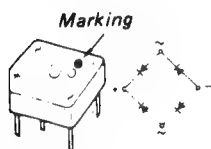
STR8124
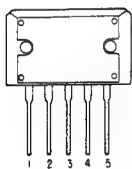
GL3HY3
TLG124A
TLR124
TLY124

long — short

anode   cathode
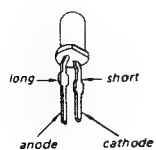
NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked " ✳ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

6-1. BEZEL AND COVERS

● : BVTT3×6   7-682-547-04
■ : B4×8   7-682-561-04
▲ : B4×6   7-682-560-09
△ : B4×6   7-682-560-04
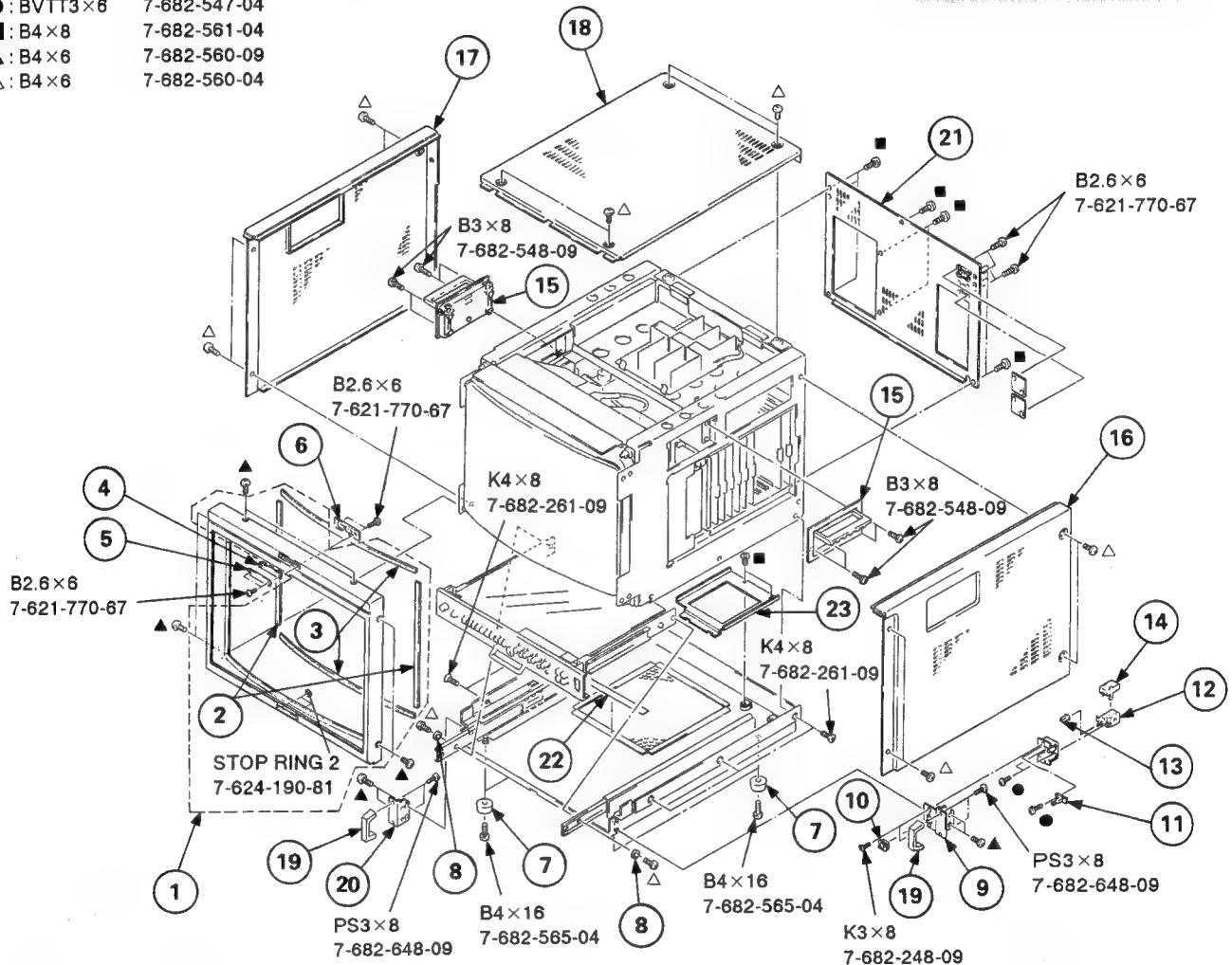
REF.NO.	PART NO.	DESCRIPTION	REMARK
1	X-4379-412-1	BEZEL ASSY	2,3
2	4-308-878-XX	CUSHION (B), BEZEL	
3	4-308-878-XX	CUSHION (A), CRT	
4	✳4-386-839-01	PLATE, TALLY	
5	✳4-386-840-01	PLATE (B), TALLY	
6	✳1-623-002-11	XB BOARD	
7	X-483-620-29	FOOT	
8	✳4-379-499-01	SPACER	
9	✳X-4379-408-1	PANEL ASSY, POWER SWITCH	
10	4-379-423-01	ESCUTCHEON (A)	
11	✳1-617-893-11	Y BOARD	

REF.NO.	PART NO.	DESCRIPTION	REMARK
12	⚠1-570-052-12	SWITCH, PUSH (AC POWER)(1 KEY)	
13	4-374-839-11	BUTTON (A)	
14	4-373-038-01	COVER, SWITCH, POWER	
15	X-3642-018-0	HANDLE ASSY	
16	✳4-386-832-01	COVER (RIGHT)	
17	✳4-386-833-01	COVER (LEFT)	
18	✳4-386-831-01	COVER (UPPER)	
19	✳4-353-706-00	HANDLE	
20	✳4-386-808-01	BRACKET (LEFT), HANDLE	
21	✳4-386-811-03	COVER, REAR	
22	4-372-556-01	SHEET, BLOTTING	
23	4-386-814-03	BRACKET, POWER	

6-2. PICTURE TUBE

□ : B3×10   7-682-549-04

The components identified by
shading and mark ⚠ are criti-
cal for safety.
Replace only with part number
specified.

Les composants identifies par
une trame et une marque ⚠.
sont critiques pour la securite.
Ne les remplacer que par une
piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
51 ⚠	8-733-053-05	CRT SD-112 (M49JJP20X)(BVP-1911 ONLY)		57 ⚠	1-452-117-31	CRT NECK ASSY	
51 ⚠	8-733-054-05	CRT SD-112 (M49JJP21X)(BVP-2011P ONLY)		58 *	1-617-889-11	C BOARD	
52	4-306-034-00	FLANGE NUT,(B) 5MM		59	4-303-774-XX	SPRING	
53	4-348-567-00	WASHER, CRT POSITION					
54	3-703-961-01	SPACER, DY		60 ⚠	1-426-328-11	COIL, DEGAUSSING	
				61	3-831-441-11	CLOTH, BLOTTING	
55 ⚠	1-451-287-21	DEFLECTION YOKE (Y14FAA)		62	1-452-032-00	MAGNET, DISK;10MMφ	
56 ⚠	1-452-261-22	CRT NECK ASSY (362)		63	1-452-094-00	MAGNET, ROTATABLE DISK; 15MMφ	

6-3. CHASSIS

● : BVTT3×6   7-682-547-04
■ : B4×8   7-682-561-04
□ : B3×10   7-682-549-04
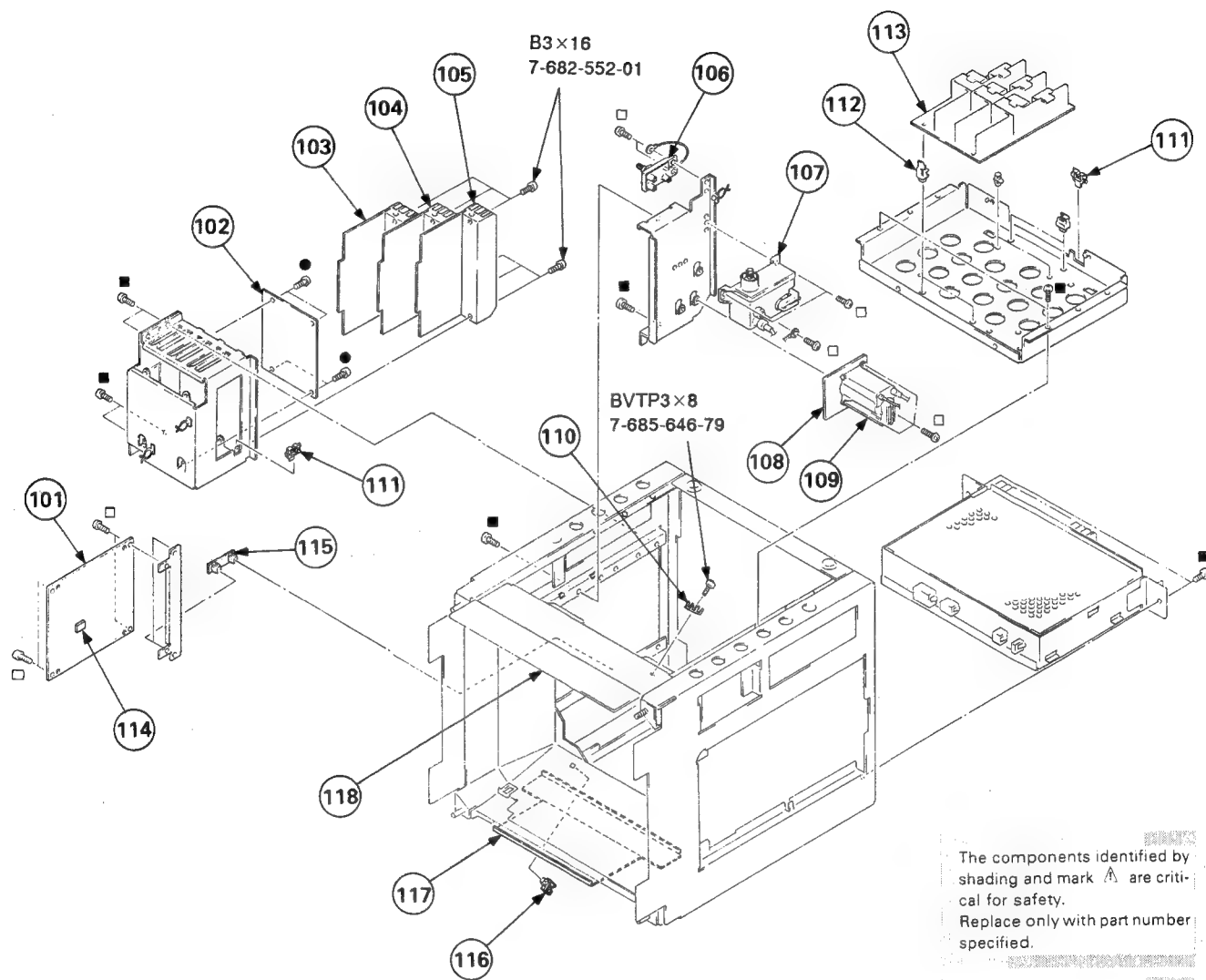
The components identified by
shading and mark ⚠ are criti-
cal for safety.
Replace only with part number
specified.

Les composants identifies par
une trame et une marque ⚠
sont critiques pour la securite.
Ne les remplacer que par une
piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION	REMARK
101	*A-1345-981-A	DB BOARD, COMPLETE	
102	*1-647-911-11	TA BOARD	
103	*A-1346-029-A	EA BOARD, COMPLETE	
104	*A-1345-731-A	EB BOARD, COMPLETE	
105	*A-1394-128-A	PA BOARD, COMPLETE	
106	⚠.1-237-165-12	RESISTOR ASSY, HIGH-VOLTAGE	
107	⚠.1-453-103-32	HIGH-VOLTAGE BLOCK (HB-203(B))	
108	*1-617-891-21	PB BOARD	
109	⚠.1-439-382-21	TRANSFORMER ASSY, FLYBACK	

REF.NO.	PART NO.	DESCRIPTION	REMARK
110	*4-309-624-00	TERMINAL, EARTH	
111	*3-646-071-00	HOLDER, WIRE	
112	*3-703-141-00	HOLDER, PCB	
113	*A-1135-464-A	BK BOARD, COMPLETE	
114	9-911-841-XX	CUSHION	
115	*4-313-732-00	CLIP, HINGE, CIRCUIT BOARD	
116	*4-314-320-00	HOLDER, WIRE	
117	*4-391-234-03	STAY, UNDER	
118	*4-386-819-02	STAY, FRONT	

6-4. SIGNAL BLOCK

● : BVTT3×6　　7-682-547-04
○ : BVTT3×6　　7-682-547-09

BVTT3×10
7-682-549-04

(BVM-2011P only)

(BVM-1911 only)

(BVM-1911 only)

REF.NO.	PART NO.	DESCRIPTION	REMARK
151	*3-337-402-01	BAND, BINDING	
152	*A-1390-344-A	TB BOARD, COMPLETE	
153	*1-627-678-11	W BOARD	
154	*1-627-677-11	V BOARD	
155	1-563-265-11	CONNECTOR, MULTIPLE 10P	
156	*4-391-220-01	PANEL (C), CONNECTOR	
157	1-565-791-11	CONNECTOR, BNC 1P	
158	*4-379-404-01	INSULATOR, BNC	
159	*A-1135-391-A	BD BOARD, COMPLETE (BVM 2011P ONLY)	
160	*4-379-439-01	PANEL (A), CONNECTOR	

REF.NO.	PART NO.	DESCRIPTION	REMARK
161	*1-618-786-11	QB BOARD	
162	*1-617-895-11	QA BOARD	
163	*A-1135-355-A	BA BOARD, COMPLETE	
164	*A-1135-606-B	BT BOARD, COMPLETE (BVM-1911 ONLY)	
165	*A-1135-357-A	BC BOARD, COMPLETE (BVM-1911 ONLY)	
166	*A-1135-358-A	BG BOARD, COMPLETE	
167	*A-1135-359-A	BH BOARD, COMPLETE	
168	*A-1135-360-A	BI BOARD, COMPLETE	
169	*A-1135-361-A	BJ BOARD, COPMLETE	
170	*1-617-885-12	GC BOARD	
171	4-370-970-01	SPACER, TR	
172	*4-363-404-00	HOLDER, 1C	

6-5. DRAWER BLOCK

● : BVTT3×6   7-682-547-04

6. EXPLODED VIEWS
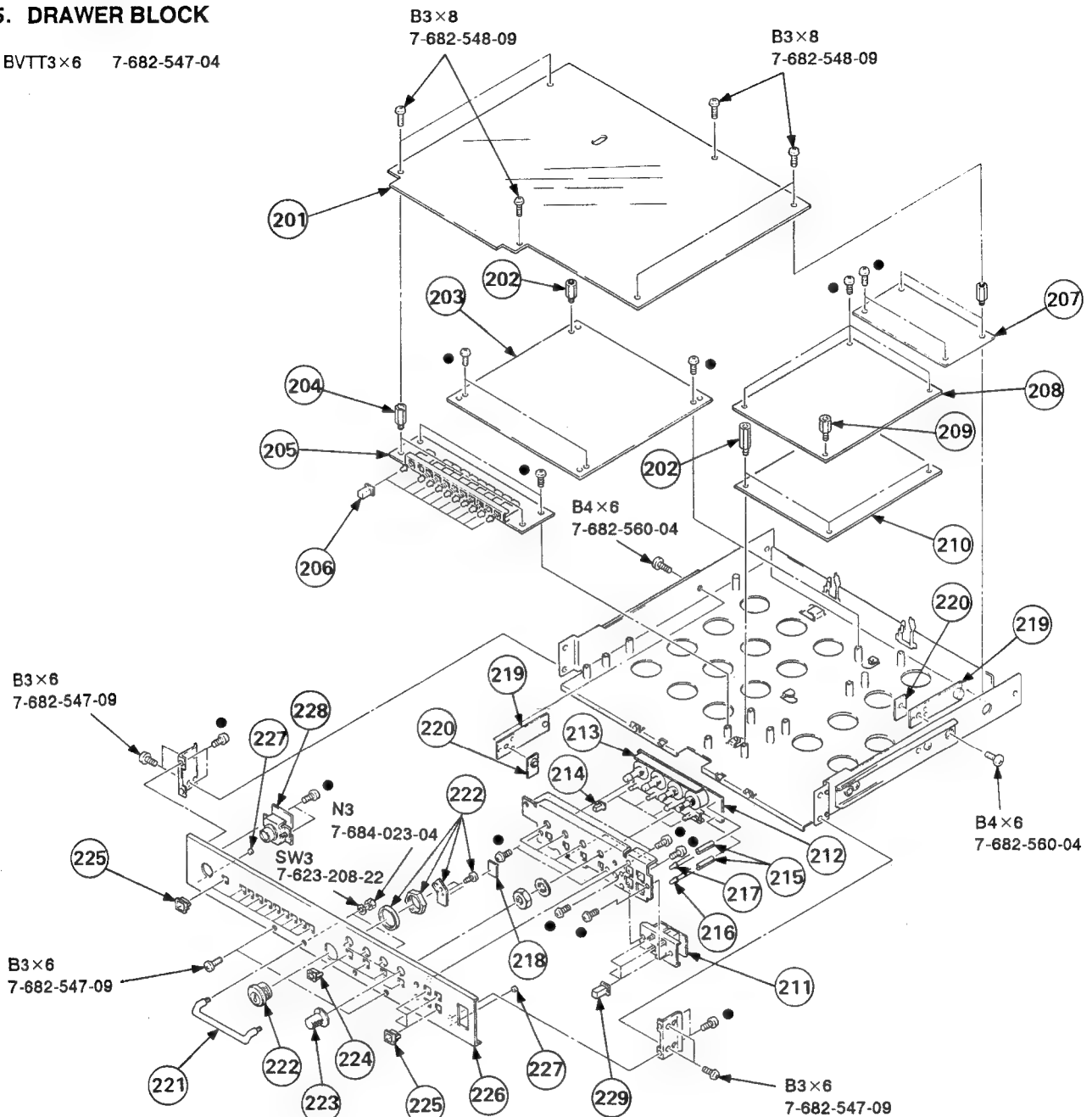
REF.NO.	PART NO.	DESCRIPTION	REMARK
201	*4-039-981-01	COVER, PC BOARD	
202	*2-264-136-00	SUPPORT, SWITCH, PUSH BUTTON	
203	*A-1345-982-A	DA BOARD, COMPLETE	
204	3-897-313-01	BOSS (17.2), RELAY	
205	*1-617-890-11	HA BOARD	
206	4-374-839-01	BUTTON (A)	
207	*A-1341-408-A	DC BOARD, COMPLETE	
208	A-1371-895-A	HY BOARD, COMPLETE	
209	*3-711-018-01	STAND OFF-BRAKE BAND GUIDE	
210	A-1371-896-A	HZ BOARD, COMPLETE	
211	*1-647-258-11	HX BOARD	
212	*1-647-257-11	HW BOARD	
213	*1-627-682-11	HH BOARD	
214	4-379-422-01	BUTTON (B)	
215	*4-026-910-00	HOLDER, LED	

REF.NO.	PART NO.	DESCRIPTION	REMARK
216	8-719-938-68	DIODE TLY124	
217	8-719-812-41	DIODE TLR124	
218	4-337-209-11	PROTECTOR, SCRATCH	
219	*X-4379-407-1	STOPPER ASSY	
220	*4-386-844-01	NUT, PLATE	
221	4-386-802-01	HANDLE, DRAWER	
222	4-378-917-01	LOCK, CYLINDER	
223	X-3673-635-0	KNOB (1) ASSY, CONTROL	
224	4-379-424-01	ESCUTCHEON (B)	
225	4-379-423-01	ESCUTCHEON (A)	
226	4-386-822-11	PANEL, CONTROL	
227	4-911-672-01	FELT, COVER	
228	1-941-422-15	CONNECTOR ASSY (ROUND TYPE)12P	
229	4-039-982-01	BUTTON (U)	

6-6. POWER BLOCK

● : BVTT3×6   7-682-547-04

P3×25
7-682-554-04

PSW3×8
7-682-948-01

PSW3×8
7-682-948-01

The components identified by shading and mark △ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque △ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION	REMARK
251	3-675-469-00	SPACER, SOLENOID	
252	4-379-421-01	HANDLE, DRAWER	
253	*A-1316-089-A	GA BOARD, COMPLETE (BVM-1911 ONLY)	254
253	*A-1316-090-A	GA BOARD, COMPLETE (BVM-2011P ONLY)	254
254	*1-627-679-11	GB BOARD	
255	*4-379-408-01	INSULATOR (G3)	
256	4-379-410-01	SPACER (G2), POLISHING	
257	4-379-403-01	SPACER (G1), POLISHING	
258	*4-374-706-00	HEAT SINK (TR)	
259	*4-371-879-02	COVER, AC SELECT	

REF.NO.	PART NO.	DESCRIPTION	REMARK
260	*4-379-409-01	NUT, PLATE	
261	△.1-570-173-22	SWITCH, VOLTAGE CHANGE	
262	*4-393-031-01	COVER, FUSE HOLDER	
263	1-533-167-21	HOLDER, FUSE	
264	△.1-532-746-11	FUSE, GLASS TUBE (4A/125V)	
265	*4-601-466-11	COVER, 3P INLET	
266	△.1-580-375-11	INLET 3P	
267	*4-379-430-01	PANEL, POWER	
268	2-990-241-02	HOLDER (A), PLUG	
269	1-533-168-21	HOLDER, FUSE	

ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark △ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque △ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

  RESISTORS
- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS   COILS
- MF : μF, PF : μμF   • MMH : mH, UH : μH

● The components identified by 🔀 in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

REF.NO.	PART NO.	DESCRIPTION			REMARK
	*1-623-002-11	XB BOARD			
		********			
		<DIODE>			
D1	8-719-901-49	DIODE LT-9010H			
D2	8-719-901-49	DIODE LT-9010H			
	*A-1135-355-A	BA BOARD, COMPLETE			
		******************			
	*4-353-708-00	HOOK, FINGER			
	8-729-119-78	TRANSISTOR 2SC2785-HFE			
		<CONNECTOR>			
BA1	*1-566-054-11	PIN, CONNECTOR 2P			
BA2	*1-566-054-11	PIN, CONNECTOR 2P			
BA3	*1-566-054-11	PIN, CONNECTOR 2P			
BA4	*1-566-054-11	PIN, CONNECTOR 2P			
BA5	*1-566-054-11	PIN, CONNECTOR 2P			
BA6	*1-566-054-11	PIN, CONNECTOR 2P			
		<COMPOTION CIRCUIT BLOCK>			
C1	1-233-030-11	COMPOSITION CIRCUIT BLOCK			
C2	1-233-030-11	COMPOSITION CIRCUIT BLOCK			
C3	1-233-030-11	COMPOSITION CIRCUIT BLOCK			
C4	1-233-030-11	COMPOSITION CIRCUIT BLOCK			
C5	1-233-030-11	COMPOSITION CIRCUIT BLOCK			
C6	1-233-030-11	COMPOSITION CIRCUIT BLOCK			
C7	1-233-030-11	COMPOSITION CIRCUIT BLOCK			
		<CAPACITOR>			
C1	1-124-910-11	ELECT	47MF	20%	16V
C2	1-124-910-11	ELECT	47MF	20%	16V
C3	1-124-910-11	ELECT	47MF	20%	16V
C4	1-124-915-11	ELECT	10MF	20%	16V
C5	1-124-910-11	ELECT	47MF	20%	16V
C6	1-124-910-11	ELECT	47MF	20%	16V
C7	1-124-910-11	ELECT	47MF	20%	16V
C8	1-124-910-11	ELECT	47MF	20%	16V
C9	1-101-004-00	CERAMIC	0.01MF		50V
C10	1-101-004-00	CERAMIC	0.01MF		50V
C11	1-126-103-11	ELECT	470MF	20%	16V
C12	1-126-101-11	ELECT	100MF	20%	16V
C13	1-126-101-11	ELECT	100MF	20%	16V
C14	1-126-101-11	ELECT	100MF	20%	16V
C15	1-126-101-11	ELECT	100MF	20%	16V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C16	1-126-101-11	ELECT	100MF	20%	16V
C17	1-126-101-11	ELECT	100MF	20%	16V
C18	1-124-915-11	ELECT	10MF	20%	16V
C19	1-124-915-11	ELECT	10MF	20%	16V
C20	1-101-004-00	CERAMIC	0.01MF		50V
C21	1-101-006-00	CERAMIC	0.047MF		50V
C31	1-101-004-00	CERAMIC	0.01MF		50V
C32	1-124-915-11	ELECT	10MF	20%	16V
C33	1-124-915-11	ELECT	10MF	20%	16V
C34	1-124-915-11	ELECT	10MF	20%	16V
C35	1-124-915-11	ELECT	10MF	20%	16V
C36	1-124-915-11	ELECT	10MF	20%	16V
C37	1-124-915-11	ELECT	10MF	20%	16V
C38	1-124-915-11	ELECT	10MF	20%	16V
C39	1-101-004-00	CERAMIC	0.01MF		50V
C51	1-126-103-11	ELECT	470MF	20%	16V
C52	1-126-101-11	ELECT	100MF	20%	16V
C53	1-126-101-11	ELECT	100MF	20%	16V
C54	1-126-101-11	ELECT	100MF	20%	16V
C55	1-126-101-11	ELECT	100MF	20%	16V
C56	1-126-101-11	ELECT	100MF	20%	16V
C57	1-126-101-11	ELECT	100MF	20%	16V
C71	1-101-004-00	CERAMIC	0.01MF		50V
C72	1-101-004-00	CERAMIC	0.01MF		50V
C73	1-101-004-00	CERAMIC	0.01MF		50V
C74	1-101-004-00	CERAMIC	0.01MF		50V
C75	1-101-004-00	CERAMIC	0.01MF		50V
C76	1-101-004-00	CERAMIC	0.01MF		50V
C77	1-101-004-00	CERAMIC	0.01MF		50V
C101	1-102-038-00	CERAMIC	0.001MF		500V
C102	1-124-915-11	ELECT	10MF	20%	16V
C103	1-102-951-00	CERAMIC	15PF	5%	50V
C104	1-123-379-00	ELECT	0.47MF	20%	50V
C201	1-102-038-00	CERAMIC	0.001MF		500V
C202	1-124-915-11	ELECT	10MF	20%	16V
C203	1-102-951-00	CERAMIC	15PF	5%	50V
C204	1-123-379-00	ELECT	0.47MF	20%	50V
C301	1-102-038-00	CERAMIC	0.001MF		500V
C302	1-124-915-11	ELECT	10MF	20%	16V
C303	1-102-965-00	CERAMIC	39PF	5%	50V
C304	1-123-379-00	ELECT	0.47MF	20%	50V
C305	1-102-947-00	CERAMIC	10PF	0.5PF	50V
C306	1-102-942-00	CERAMIC	5PF	1PF	50V
C401	1-102-038-00	CERAMIC	0.001MF		500V
C402	1-124-915-11	ELECT	10MF	20%	16V
C403	1-102-951-00	CERAMIC	15PF	5%	50V
C404	1-123-379-00	ELECT	0.47MF	20%	50V
C501	1-102-038-00	CERAMIC	0.001MF		500V
C502	1-124-915-11	ELECT	10MF	20%	16V
C503	1-102-951-00	CERAMIC	15PF	5%	50V
C504	1-123-379-00	ELECT	0.47MF	20%	50V

REF.NO.	PART NO.	DESCRIPTION				REMARK
C601	1-102-038-00	CERAMIC	0.001MF			500V
C602	1-124-915-11	ELECT	10MF	20%		16V
C603	1-102-951-00	CERAMIC	15PF	5%		50V
C604	1-123-379-00	ELECT	0.47MF	20%		50V
C701	1-102-976-00	CERAMIC	180PF	5%		50V
C702	1-102-947-00	CERAMIC	10PF	0.5PF		50V
C703	1-124-915-11	ELECT	10MF	20%		16V
C704	1-124-910-11	ELECT	47MF	20%		16V
C705	1-136-153-00	FILM	0.01MF	5%		50V
C706	1-124-791-11	ELECT	1MF	20%		50V
C707	1-123-369-00	ELECT	4.7MF	20%		25V
C708	1-124-915-11	ELECT	10MF	20%		16V
C709	1-102-973-00	CERAMIC	100PF	5%		50V
C710	1-130-481-00	MYLAR	0.0068MF	5%		50V
C711	1-136-155-00	FILM	0.015MF	5%		50V
C712	1-130-471-00	MYLAR	0.001MF	5%		50V
C713	1-124-791-11	ELECT	1MF	20%		50V
C714	1-102-973-00	CERAMIC	100PF	5%		50V
C715	1-101-361-00	CERAMIC	150PF	5%		50V
C716	1-136-153-00	FILM	0.01MF	5%		50V
C717	1-102-973-00	CERAMIC	100PF	5%		50V

<TRIMMER>

REF.NO.	PART NO.	DESCRIPTION
CV101	1-141-179-12	CAP, VAR, TRIMMER
CV102	1-141-260-00	TRIMAR, CERAMIC
CV201	1-141-179-12	CAP, VAR, TRIMMER
CV202	1-141-260-00	TRIMAR, CERAMIC
CV401	1-141-179-12	CAP, VAR, TRIMMER
CV402	1-141-260-00	TRIMAR, CERAMIC
CV501	1-141-179-12	CAP, VAR, TRIMMER
CV502	1-141-260-00	TRIMAR, CERAMIC
CV601	1-141-179-12	CAP, VAR, TRIMMER
CV602	1-141-260-00	TRIMAR, CERAMIC

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-109-63	DIODE RD3.0ESB2
D2	8-719-000-06	DIODE MC921
D4	8-719-000-04	DIODE MC911
D701	8-719-911-19	DIODE 1SS119
D702	8-719-109-75	DIODE RD4.3ESB2
D703	8-719-911-19	DIODE 1SS119
D704	8-719-911-19	DIODE 1SS119
D705	8-719-911-19	DIODE 1SS119
D706	8-719-911-19	DIODE 1SS119
D707	8-719-911-19	DIODE 1SS119
D708	8-719-911-19	DIODE 1SS119
D709	8-719-911-19	DIODE 1SS119
D710	8-719-911-19	DIODE 1SS119

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-208-94	IC CX-894
IC2	8-759-208-94	IC CX-894
IC3	8-759-140-53	IC UPD4053BC

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-900-89	TRANSISTOR DTC144ES
Q2	8-729-384-48	TRANSISTOR 2SA844-E
Q3	8-729-900-89	TRANSISTOR DTC144ES
Q4	8-729-900-89	TRANSISTOR DTC144ES
Q5	8-729-900-89	TRANSISTOR DTC144ES

REF.NO.	PART NO.	DESCRIPTION			REMARK
Q6	8-729-900-65	TRANSISTOR DTA144ES			
Q101	8-729-266-82	TRANSISTOR 2SC2668-O			
Q102	8-729-266-82	TRANSISTOR 2SC2668-O			
Q103	8-729-266-82	TRANSISTOR 2SC2668-O			
Q104	8-729-384-48	TRANSISTOR 2SA844-E			
Q105	8-729-266-82	TRANSISTOR 2SC2668-O			
Q201	8-729-266-82	TRANSISTOR 2SC2668-O			
Q202	8-729-266-82	TRANSISTOR 2SC2668-O			
Q203	8-729-266-82	TRANSISTOR 2SC2668-O			
Q204	8-729-384-48	TRANSISTOR 2SA844-E			
Q205	8-729-266-82	TRANSISTOR 2SC2668-O			
Q301	8-729-266-82	TRANSISTOR 2SC2668-O			
Q302	8-729-266-82	TRANSISTOR 2SC2668-O			
Q303	8-729-266-82	TRANSISTOR 2SC2668-O			
Q304	8-729-384-48	TRANSISTOR 2SA844-E			
Q305	8-729-266-82	TRANSISTOR 2SC2668-O			
Q401	8-729-266-82	TRANSISTOR 2SC2668-O			
Q402	8-729-266-82	TRANSISTOR 2SC2668-O			
Q403	8-729-266-82	TRANSISTOR 2SC2668-O			
Q404	8-729-384-48	TRANSISTOR 2SA844-E			
Q405	8-729-266-82	TRANSISTOR 2SC2668-O			
Q501	8-729-266-82	TRANSISTOR 2SC2668-O			
Q502	8-729-266-82	TRANSISTOR 2SC2668-O			
Q503	8-729-266-82	TRANSISTOR 2SC2668-O			
Q504	8-729-384-48	TRANSISTOR 2SA844-E			
Q505	8-729-266-82	TRANSISTOR 2SC2668-O			
Q601	8-729-266-82	TRANSISTOR 2SC2668-O			
Q602	8-729-266-82	TRANSISTOR 2SC2668-O			
Q603	8-729-266-82	TRANSISTOR 2SC2668-O			
Q604	8-729-384-48	TRANSISTOR 2SA844-E			
Q605	8-729-266-82	TRANSISTOR 2SC2668-O			
Q701	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q702	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q703	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q704	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q705	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q706	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q707	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q708	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q709	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q710	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q711	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q712	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q713	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q714	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q715	8-729-800-10	TRANSISTOR 2SC3068			
Q716	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q717	8-729-119-76	TRANSISTOR 2SA1175-HFE			

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-249-405-11	CARBON	100	5%	1/4W
R2	1-249-405-11	CARBON	100	5%	1/4W
R3	1-249-405-11	CARBON	100	5%	1/4W
R4	1-249-437-11	CARBON	47K	5%	1/4W
R5	1-249-405-11	CARBON	100	5%	1/4W
R6	1-249-432-11	CARBON	18K	5%	1/4W
R7	1-249-434-11	CARBON	27K	5%	1/4W
R8	1-249-422-11	CARBON	2.7K	5%	1/4W
R9	1-249-405-11	CARBON	100	5%	1/4W
R10	1-249-405-11	CARBON	100	5%	1/4W
R11	1-249-433-11	CARBON	22K	5%	1/4W
R12	1-249-405-11	CARBON	100	5%	1/4W
R13	1-249-437-11	CARBON	47K	5%	1/4W

REF.NO.	PART NO.	DESCRIPTION				REMARK
R14	1-249-429-11	CARBON	10K	5%	1/4W	
R101	1-249-417-11	CARBON	1K	5%	1/4W	
R102	1-249-418-11	CARBON	1.2K	5%	1/4W	
R103	1-249-425-11	CARBON	4.7K	5%	1/4W	
R104	1-249-405-11	CARBON	100	5%	1/4W	
R105	1-215-437-00	METAL	4.7K	1%	1/4W	
R106	1-249-430-11	CARBON	12K	5%	1/4W	
R107	1-249-433-11	CARBON	22K	5%	1/4W	
R108	1-215-427-00	METAL	1.8K	1%	1/4W	
R109	1-215-415-00	METAL	560	1%	1/4W	
R110	1-249-405-11	CARBON	100	5%	1/4W	
R111	1-215-431-00	METAL	2.7K	1%	1/4W	
R112	1-249-421-11	CARBON	2.2K	5%	1/4W	
R113	1-249-393-11	CARBON	10	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W	
R202	1-249-418-11	CARBON	1.2K	5%	1/4W	
R203	1-249-425-11	CARBON	4.7K	5%	1/4W	
R204	1-249-405-11	CARBON	100	5%	1/4W	
R205	1-215-437-00	METAL	4.7K	1%	1/4W	
R206	1-249-430-11	CARBON	12K	5%	1/4W	
R207	1-249-433-11	CARBON	22K	5%	1/4W	
R208	1-215-427-00	METAL	1.8K	1%	1/4W	
R209	1-215-415-00	METAL	560	1%	1/4W	
R210	1-249-405-11	CARBON	100	5%	1/4W	
R211	1-215-431-00	METAL	2.7K	1%	1/4W	
R212	1-249-421-11	CARBON	2.2K	5%	1/4W	
R213	1-249-393-11	CARBON	10	5%	1/4W	
R301	1-249-417-11	CARBON	1K	5%	1/4W	
R302	1-249-418-11	CARBON	1.2K	5%	1/4W	
R303	1-249-426-11	CARBON	5.6K	5%	1/4W	
R304	1-249-405-11	CARBON	100	5%	1/4W	
R305	1-249-426-11	CARBON	5.6K	5%	1/4W	
R306	1-249-430-11	CARBON	12K	5%	1/4W	
R307	1-249-432-11	CARBON	18K	5%	1/4W	
R308	1-249-421-11	CARBON	2.2K	5%	1/4W	
R309	1-249-417-11	CARBON	1K	5%	1/4W	
R310	1-249-405-11	CARBON	100	5%	1/4W	
R311	1-249-417-11	CARBON	1K	5%	1/4W	
R312	1-249-421-11	CARBON	2.2K	5%	1/4W	
R313	1-249-393-11	CARBON	10	5%	1/4W	
R401	1-249-417-11	CARBON	1K	5%	1/4W	
R402	1-249-418-11	CARBON	1.2K	5%	1/4W	
R403	1-249-425-11	CARBON	4.7K	5%	1/4W	
R404	1-249-405-11	CARBON	100	5%	1/4W	
R405	1-215-437-00	METAL	4.7K	1%	1/4W	
R406	1-249-430-11	CARBON	12K	5%	1/4W	
R407	1-249-433-11	CARBON	22K	5%	1/4W	
R408	1-215-427-00	METAL	1.8K	1%	1/4W	
R409	1-215-415-00	METAL	560	1%	1/4W	
R410	1-249-405-11	CARBON	100	5%	1/4W	
R411	1-215-431-00	METAL	2.7K	1%	1/4W	
R412	1-249-421-11	CARBON	2.2K	5%	1/4W	
R413	1-249-393-11	CARBON	10	5%	1/4W	
R501	1-249-417-11	CARBON	1K	5%	1/4W	
R502	1-249-418-11	CARBON	1.2K	5%	1/4W	
R503	1-249-425-11	CARBON	4.7K	5%	1/4W	
R504	1-249-405-11	CARBON	100	5%	1/4W	
R505	1-215-437-00	METAL	4.7K	1%	1/4W	
R506	1-249-430-11	CARBON	12K	5%	1/4W	
R507	1-249-433-11	CARBON	22K	5%	1/4W	
R508	1-215-427-00	METAL	1.8K	1%	1/4W	
R509	1-215-415-00	METAL	560	1%	1/4W	
R510	1-249-405-11	CARBON	100	5%	1/4W	
R511	1-215-431-00	METAL	2.7K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R512	1-249-421-11	CARBON	2.2K	5%	1/4W	
R513	1-249-393-11	CARBON	10	5%	1/4W	
R601	1-249-417-11	CARBON	1K	5%	1/4W	
R602	1-249-418-11	CARBON	1.2K	5%	1/4W	
R603	1-249-425-11	CARBON	4.7K	5%	1/4W	
R604	1-249-405-11	CARBON	100	5%	1/4W	
R605	1-215-437-00	METAL	4.7K	1%	1/4W	
R606	1-249-430-11	CARBON	12K	5%	1/4W	
R607	1-249-433-11	CARBON	22K	5%	1/4W	
R608	1-215-427-00	METAL	1.8K	1%	1/4W	
R609	1-215-415-00	METAL	560	1%	1/4W	
R610	1-249-405-11	CARBON	100	5%	1/4W	
R611	1-215-431-00	METAL	2.7K	1%	1/4W	
R612	1-249-421-11	CARBON	2.2K	5%	1/4W	
R613	1-249-393-11	CARBON	10	5%	1/4W	
R701	1-249-433-11	CARBON	22K	5%	1/4W	
R702	1-249-438-11	CARBON	56K	5%	1/4W	
R703	1-249-417-11	CARBON	1K	5%	1/4W	
R704	1-249-417-11	CARBON	1K	5%	1/4W	
R705	1-249-424-11	CARBON	3.9K	5%	1/4W	
R706	1-249-417-11	CARBON	1K	5%	1/4W	
R707	1-249-429-11	CARBON	10K	5%	1/4W	
R708	1-249-421-11	CARBON	2.2K	5%	1/4W	
R709	1-249-419-11	CARBON	1.5K	5%	1/4W	
R710	1-249-418-11	CARBON	1.2K	5%	1/4W	
R711	1-249-434-11	CARBON	27K	5%	1/4W	
R712	1-249-433-11	CARBON	22K	5%	1/4W	
R713	1-249-422-11	CARBON	2.7K	5%	1/4W	
R714	1-249-427-11	CARBON	6.8K	5%	1/4W	
R715	1-249-433-11	CARBON	22K	5%	1/4W	
R716	1-249-422-11	CARBON	2.7K	5%	1/4W	
R717	1-249-425-11	CARBON	4.7K	5%	1/4W	
R718	1-249-410-11	CARBON	270	5%	1/4W	
R719	1-249-414-11	CARBON	560	5%	1/4W	
R720	1-247-850-11	CARBON	6.2K	5%	1/4W	
R721	1-249-438-11	CARBON	56K	5%	1/4W	
R722	1-249-441-11	CARBON	100K	5%	1/4W	
R723	1-249-437-11	CARBON	47K	5%	1/4W	
R724	1-249-429-11	CARBON	10K	5%	1/4W	
R725	1-249-438-11	CARBON	56K	5%	1/4W	
R726	1-247-895-00	CARBON	470K	5%	1/4W	
R727	1-249-425-11	CARBON	4.7K	5%	1/4W	
R728	1-249-435-11	CARBON	33K	5%	1/4W	
R729	1-249-423-11	CARBON	3.3K	5%	1/4W	
R730	1-249-421-11	CARBON	2.2K	5%	1/4W	
R731	1-249-422-11	CARBON	2.7K	5%	1/4W	
R732	1-249-422-11	CARBON	2.7K	5%	1/4W	
R733	1-249-421-11	CARBON	2.2K	5%	1/4W	
R734	1-249-421-11	CARBON	2.2K	5%	1/4W	
R735	1-249-421-11	CARBON	2.2K	5%	1/4W	
R736	1-249-425-11	CARBON	4.7K	5%	1/4W	
R737	1-249-405-11	CARBON	100	5%	1/4W	
R738	1-249-441-11	CARBON	100K	5%	1/4W	
R739	1-249-433-11	CARBON	22K	5%	1/4W	
R740	1-249-417-11	CARBON	1K	5%	1/4W	
R741	1-202-473-00	SOLID	5.6M	5%	1/4W	
R906	1-249-389-11	CARBON	4.7	5%	1/4W	
R907	1-249-389-11	CARBON	4.7	5%	1/4W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION		REMARK
RV101	1-237-514-21	RES, ADJ, CERMET 500		
RV201	1-237-514-21	RES, ADJ, CERMET 500		

BA BC

REF.NO.	PART NO.	DESCRIPTION				REMARK
RV401	1-237-514-21	RES, ADJ, CERMET 500				
RV501	1-237-514-21	RES, ADJ, CERMET 500				
RV601	1-237-514-21	RES, ADJ, CERMET 500				

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	*A-1135-357-A	BC BOARD, COMPLETE (BVM-1911 ONLY)
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	*4-353-708-00	HOOK, FINGER

\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-102-951-00	CERAMIC	15PF	5%		50V
C2	1-102-951-00	CERAMIC	15PF	5%		50V
C3	1-102-947-00	CERAMIC	10PF	0.5PF		50V
C4	1-101-880-00	CERAMIC	47PF	5%		50V
C5	1-102-965-00	CERAMIC	39PF	5%		50V
C6	1-101-004-00	CERAMIC	0.01MF			50V
C7	1-102-935-00	CERAMIC	2PF	0.25PF		50V
C8	1-101-361-00	CERAMIC	39PF	5%		50V
C9	1-124-915-11	ELECT	10MF	20%		16V
C10	1-124-915-11	ELECT	10MF	20%		16V
C11	1-101-004-00	CERAMIC	0.01MF			50V
C12	1-101-004-00	CERAMIC	0.01MF			50V
C13	1-101-004-00	CERAMIC	0.01MF			50V
C14	1-101-004-00	CERAMIC	0.01MF			50V
C15	1-124-910-11	ELECT	47MF	20%		16V
C16	1-124-910-11	ELECT	47MF	20%		16V
C17	1-124-034-51	ELECT	33MF	20%		16V
C18	1-101-004-00	CERAMIC	0.01MF			50V
C19	1-102-953-00	CERAMIC	18PF	5%		50V
C20	1-102-951-00	CERAMIC	15PF	5%		50V
C22	1-101-884-00	CERAMIC	56PF	5%		50V
C23	1-123-369-00	ELECT	4.7MF	20%		25V
C24	1-163-157-00	FILM	0.022MF	5%		50V
C25	1-163-157-00	FILM	0.022MF	5%		50V
C26	1-101-004-00	CERAMIC	0.01MF			50V
C27	1-101-004-00	CERAMIC	0.01MF			50V
C28	1-123-379-00	ELECT	0.47MF	20%		50V
C29	1-101-004-00	CERAMIC	0.01MF			50V
C30	1-101-004-00	CERAMIC	0.01MF			50V
C31	1-124-119-00	ELECT	330MF	20%		16V
C34	1-109-676-00	MICA	130PF	1%		500V
C35	1-109-631-00	MICA	330PF	1%		500V
C36	1-102-960-00	CERAMIC	24PF	5%		50V
C39	1-109-676-00	MICA	130PF	1%		500V
C40	1-109-631-00	MICA	330PF	1%		500V
C41	1-102-960-00	CERAMIC	24PF	5%		50V
C42	1-101-004-00	CERAMIC	0.01MF			50V
C50	1-102-942-00	CERAMIC	5PF	0.5PF		50V
C101	1-124-034-51	ELECT	33MF	20%		16V
C102	1-101-004-00	CERAMIC	0.01MF			50V
C103	1-124-917-11	ELECT	33MF	20%		25V
C104	1-124-034-51	ELECT	33MF	20%		16V
C105	1-101-004-00	CERAMIC	0.01MF			50V
C106	1-124-917-11	ELECT	33MF	20%		25V
C107	1-101-004-00	CERAMIC	0.01MF			50V
C111	1-124-034-51	ELECT	33MF	20%		16V
C112	1-124-034-51	ELECT	33MF	20%		16V
C113	1-124-034-51	ELECT	33MF	20%		16V
C116	1-101-004-00	CERAMIC	0.01MF			50V
C117	1-101-004-00	CERAMIC	0.01MF			50V
C118	1-101-004-00	CERAMIC	0.01MF			50V
C121	1-124-034-51	ELECT	33MF	20%		16V

REF.NO.	PART NO.	DESCRIPTION				REMARK
C122	1-124-034-51	ELECT	33MF	20%		16V
C123	1-124-034-51	ELECT	33MF	20%		16V
C126	1-101-004-00	CERAMIC	0.01MF			50V
C127	1-101-004-00	CERAMIC	0.01MF			50V
C128	1-101-004-00	CERAMIC	0.01MF			50V
C131	1-124-034-51	ELECT	33MF	20%		16V
C132	1-124-034-51	ELECT	33MF	20%		16V
C133	1-124-034-51	ELECT	33MF	20%		16V
C136	1-101-004-00	CERAMIC	0.01MF			50V
C137	1-101-004-00	CERAMIC	0.01MF			50V
C138	1-101-004-00	CERAMIC	0.01MF			50V
C139	1-101-004-00	CERAMIC	0.01MF			50V
C143	1-101-004-00	CERAMIC	0.01MF			50V
C144	1-126-233-11	ELECT	22MF	20%		25V
C201	1-124-917-11	ELECT	33MF	20%		25V
C202	1-101-004-00	CERAMIC	0.01MF			50V

\<TRIMMER\>

REF.NO.	PART NO.	DESCRIPTION
CV1	1-141-171-00	CAP, TRIMMER 15P
CV2	1-141-171-00	CAP, TRIMMER 15P

\<DIODE\>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-911-19	DIODE 1SS119
D2	8-719-920-95	DIODE 1T25-0
D3	8-719-911-19	DIODE 1SS119
D4	8-719-110-13	DIODE RD9.1ESB2
D5	8-719-911-19	DIODE 1SS119
D6	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119

\<IC\>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-204-21	IC TA7193P
IC2	8-752-006-12	IC CX20061
IC3	8-759-140-53	IC UPD4053BC

\<COIL\>

REF.NO.	PART NO.	DESCRIPTION	
L1	1-408-533-00	COIL, VARIABLE	
L2	1-408-513-00	COIL (VARIABLE)	
L3	1-408-533-00	COIL, VARIABLE	
L4	1-408-429-00	INDUCTOR	470UH
L5	1-408-429-00	INDUCTOR	470UH
L6	1-408-429-00	INDUCTOR	470UH

\<TRANSISTOR\>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q4	8-729-800-10	TRANSISTOR 2SC3068
Q5	8-729-800-10	TRANSISTOR 2SC3068
Q6	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q9	8-729-384-48	TRANSISTOR 2SA844-E
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q11	8-729-384-48	TRANSISTOR 2SA844-E
Q12	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q13	8-729-384-48	TRANSISTOR 2SA844-E
Q14	8-729-384-48	TRANSISTOR 2SA844-E
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE

REF.NO.	PART NO.	DESCRIPTION			REMARK
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q18	8-729-800-10	TRANSISTOR 2SC3068			
Q19	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q20	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q21	8-729-800-10	TRANSISTOR 2SC3068			
Q101	8-729-140-97	TRANSISTOR 2SB734-34			
Q103	8-729-900-63	TRANSISTOR DTA124ES			
Q104	8-729-900-63	TRANSISTOR DTA124ES			

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-249-428-11	CARBON	8.2K	5%	1/4W
R2	1-249-429-11	CARBON	10K	5%	1/4W
R3	1-249-405-11	CARBON	100	5%	1/4W
R4	1-249-422-11	CARBON	2.7K	5%	1/4W
R5	1-215-421-00	METAL	1K	1%	1/4W
R6	1-215-398-00	METAL	110	1%	1/4W
R7	1-249-405-11	CARBON	100	5%	1/4W
R8	1-215-421-00	METAL	1K	1%	1/4W
R9	1-215-421-00	METAL	1K	1%	1/4W
R10	1-215-423-00	METAL	1.2K	1%	1/4W
R11	1-249-405-11	CARBON	100	5%	1/4W
R12	1-215-425-00	METAL	1.5K	1%	1/4W
R13	1-215-425-00	METAL	1.5K	1%	1/4W
R14	1-215-405-00	METAL	220	1%	1/4W
R15	1-249-405-11	CARBON	100	5%	1/4W
R16	1-249-433-11	CARBON	22K	5%	1/4W
R17	1-249-433-11	CARBON	22K	5%	1/4W
R18	1-249-421-11	CARBON	2.2K	5%	1/4W
R19	1-249-425-11	CARBON	4.7K	5%	1/4W
R20	1-249-429-11	CARBON	10K	5%	1/4W
R22	1-249-429-11	CARBON	10K	5%	1/4W
R23	1-249-431-11	CARBON	15K	5%	1/4W
R24	1-249-428-11	CARBON	8.2K	5%	1/4W
R25	1-249-405-11	CARBON	100	5%	1/4W
R26	1-249-417-11	CARBON	1K	5%	1/4W
R27	1-249-405-11	CARBON	100	5%	1/4W
R28	1-249-417-11	CARBON	1K	5%	1/4W
R29	1-249-405-11	CARBON	100	5%	1/4W
R30	1-249-425-11	CARBON	4.7K	5%	1/4W
R31	1-249-425-11	CARBON	4.7K	5%	1/4W
R32	1-249-433-11	CARBON	22K	5%	1/4W
R33	1-249-405-11	CARBON	100	5%	1/4W
R34	1-215-425-00	METAL	1.5K	1%	1/4W
R35	1-215-425-00	METAL	1.5K	1%	1/4W
R36	1-215-425-00	METAL	1.5K	1%	1/4W
R37	1-215-425-00	METAL	1.5K	1%	1/4W
R38	1-215-439-00	METAL	5.6K	1%	1/4W
R39	1-215-469-00	METAL	100K	1%	1/4W
R40	1-247-903-00	CARBON	1M	5%	1/4W
R41	1-249-427-11	CARBON	6.8K	5%	1/4W
R42	1-249-420-11	CARBON	1.8K	5%	1/4W
R43	1-249-415-11	CARBON	680	5%	1/4W
R44	1-249-418-11	CARBON	1.2K	5%	1/4W
R45	1-249-422-11	CARBON	2.7K	5%	1/4W
R47	1-249-413-11	CARBON	470	5%	1/4W
R49	1-249-413-11	CARBON	470	5%	1/4W
R50	1-249-405-11	CARBON	100	5%	1/4W
R51	1-215-417-00	METAL	680	1%	1/4W
R52	1-215-417-00	METAL	680	1%	1/4W
R53	1-215-413-00	METAL	470	1%	1/4W
R54	1-215-443-00	METAL	8.2K	1%	1/4W
R55	1-249-421-11	CARBON	2.2K	5%	1/4W

REF.NO.	PART NO.	DESCRIPTION			REMARK
R56	1-249-441-11	CARBON	100K	5%	1/4W
R57	1-249-417-11	CARBON	1K	5%	1/4W
R58	1-249-417-11	CARBON	1K	5%	1/4W
R59	1-249-429-11	CARBON	10K	5%	1/4W
R60	1-249-433-11	CARBON	22K	5%	1/4W
R61	1-249-420-11	CARBON	1.8K	5%	1/4W
R62	1-249-429-11	CARBON	10K	5%	1/4W
R63	1-249-425-11	CARBON	4.7K	5%	1/4W
R64	1-249-429-11	CARBON	10K	5%	1/4W
R65	1-215-421-00	METAL	1K	1%	1/4W
R68	1-249-427-11	CARBON	6.8K	5%	1/4W
R69	1-215-420-00	METAL	910	1%	1/4W
R70	1-215-420-00	METAL	910	1%	1/4W
R71	1-215-417-00	METAL	680	1%	1/4W
R72	1-249-422-11	CARBON	2.7K	5%	1/4W
R73	1-249-405-11	CARBON	100	5%	1/4W
R74	1-215-421-00	METAL	1K	1%	1/4W
R77	1-249-427-11	CARBON	6.8K	5%	1/4W
R78	1-215-420-00	METAL	910	1%	1/4W
R79	1-215-420-00	METAL	910	1%	1/4W
R80	1-215-417-00	METAL	680	1%	1/4W
R81	1-249-422-11	CARBON	2.7K	5%	1/4W
R82	1-249-405-11	CARBON	100	5%	1/4W
R83	1-215-481-00	METAL	330K	1%	1/4W
R85	1-215-429-00	METAL	2.2K	1%	1/4W
R86	1-215-415-00	METAL	560	1%	1/4W
R87	1-215-477-00	METAL	220K	1%	1/4W
R88	1-215-457-00	METAL	33K	1%	1/4W
R90	1-249-429-11	CARBON	10K	5%	1/4W
R91	1-249-433-11	CARBON	22K	5%	1/4W
R95	1-249-429-11	CARBON	10K	5%	1/4W
R96	1-249-433-11	CARBON	22K	5%	1/4W
R101	1-249-423-11	CARBON	3.3K	5%	1/4W
R102	1-249-419-11	CARBON	1.5K	5%	1/4W
R103	1-249-427-11	CARBON	6.8K	5%	1/4W
R104	1-249-422-11	CARBON	2.7K	5%	1/4W
R105	1-249-429-11	CARBON	10K	5%	1/4W
R202	1-249-429-11	CARBON	10K	5%	1/4W

\<VARIABLE RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION
RV1	1-237-500-21	RES, ADJ, CERMET 1K
RV2	1-237-504-21	RES, ADJ, CERMET 20K
RV3	1-237-499-21	RES, ADJ, CERMET 500
RV4	1-237-501-21	RES, ADJ, CERMET 2K
RV5	1-237-501-21	RES, ADJ, CERMET 2K

\<CRYSTAL\>

REF.NO.	PART NO.	DESCRIPTION
X1	1-567-505-11	OSCILLATOR, CRYSTAL

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   *A-1135-391-A BD BOARD, COMPLETE (BVM-2011P ONLY)
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   *4-353-708-00 HOOK, FINGER

\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION				
C1	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C2	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C3	1-102-963-00	CERAMIC	33PF	5%	50V	
C4	1-101-880-00	CERAMIC	47PF	5%	50V	
C6	1-101-888-00	CERAMIC	68PF	5%	50V	

REF.NO.	PART NO.	DESCRIPTION			REMARK	REF.NO.	PART NO.	DESCRIPTION			REMARK
C7	1-102-963-00	CERAMIC	33PF	5%	50V	C103	1-124-034-51	ELECT	33MF	20%	16V
C8	1-102-943-00	CERAMIC	6PF	0.5PF	50V						
C9	1-126-966-11	ELECT	10MF	20%	16V	C104	1-124-034-51	ELECT	33MF	20%	16V
C10	1-126-966-11	ELECT	10MF	20%	16V	C106	1-124-034-51	ELECT	33MF	20%	16V
C11	1-101-004-00	CERAMIC	0.01MF		50V	C107	1-124-034-51	ELECT	33MF	20%	16V
						C108	1-124-034-51	ELECT	33MF	20%	16V
C12	1-101-004-00	CERAMIC	0.01MF		50V	C109	1-124-034-51	ELECT	33MF	20%	16V
C13	1-101-004-00	CERAMIC	0.01MF		50V						
C14	1-101-004-00	CERAMIC	0.01MF		50V	C110	1-124-034-51	ELECT	33MF	20%	16V
C15	1-101-004-00	CERAMIC	0.01MF		50V	C111	1-124-034-51	ELECT	33MF	20%	16V
C16	1-101-004-00	CERAMIC	0.01MF		50V	C112	1-124-119-00	ELECT	330MF	20%	16V
						C114	1-124-034-51	ELECT	33MF	20%	16V
C17	1-136-165-00	FILM	0.1MF	5%	50V	C115	1-124-034-51	ELECT	33MF	20%	16V
C18	1-102-950-00	CERAMIC	13PF	5%	50V						
C19	1-102-951-00	CERAMIC	15PF	5%	50V	C121	1-101-004-00	CERAMIC	0.01MF		50V
C20	1-101-888-00	CERAMIC	68PF	5%	50V	C122	1-101-004-00	CERAMIC	0.01MF		50V
C21	1-163-157-00	FILM	0.022MF	5%	50V	C123	1-101-004-00	CERAMIC	0.01MF		50V
						C124	1-101-004-00	CERAMIC	0.01MF		50V
C22	1-163-157-00	FILM	0.022MF	5%	50V	C125	1-101-004-00	CERAMIC	0.01MF		50V
C23	1-124-903-11	ELECT	1MF	20%	50V						
C24	1-101-004-00	CERAMIC	0.01MF		50V	C126	1-101-004-00	CERAMIC	0.01MF		50V
C25	1-124-910-11	ELECT	47MF	20%	16V	C200	1-124-034-51	ELECT	33MF	20%	16V
C26	1-109-628-00	MICA	160PF	1%	500V	C201	1-124-910-11	ELECT	47MF	20%	25V
						C202	1-124-034-51	ELECT	33MF	20%	16V
C27	1-102-960-00	CERAMIC	24PF	5%	50V	C203	1-124-034-51	ELECT	33MF	20%	16V
C28	1-109-631-00	MICA	330PF	1%	500V						
C29	1-124-910-11	ELECT	47MF	20%	16V	C204	1-101-004-00	CERAMIC	0.01MF		50V
C30	1-109-628-00	MICA	160PF	1%	500V	C220	1-101-004-00	CERAMIC	0.01MF		50V
C31	1-102-960-00	CERAMIC	24PF	5%	50V	C221	1-101-004-00	CERAMIC	0.01MF		50V
						C222	1-101-004-00	CERAMIC	0.01MF		50V
C32	1-109-631-00	MICA	330PF	1%	500V	C224	1-101-004-00	CERAMIC	0.01MF		50V
C33	1-101-004-00	CERAMIC	0.01MF		50V						
C34	1-136-153-00	FILM	0.01MF	5%	50V	C225	1-101-004-00	CERAMIC	0.01MF		50V
C35	1-101-004-00	CERAMIC	0.01MF		50V	C226	1-101-004-00	CERAMIC	0.01MF		50V
C36	1-124-902-00	ELECT	0.47MF	20%	50V	C227	1-126-233-11	ELECT	22MF	20%	25V
						C250	1-124-034-51	ELECT	33MF	20%	16V
C37	1-101-004-00	CERAMIC	0.01MF		50V	C251	1-101-004-00	CERAMIC	0.01MF		50V
C38	1-123-382-00	ELECT	3.3MF	20%	50V						
C39	1-109-667-11	MICA	56PF	1%	500V	C301	1-101-004-00	CERAMIC	0.01MF		50V
C40	1-102-942-00	CERAMIC	5PF	0.5PF	50V	C302	1-101-004-00	CERAMIC	0.01MF		50V
C41	1-109-621-00	MICA	220PF	1%	500V	C303	1-101-004-00	CERAMIC	0.01MF		50V
						C304	1-102-947-00	CERAMIC	10PF	0.5PF	50V
C43	1-124-910-11	ELECT	47MF	20%	16V	C312	1-101-004-00	CERAMIC	0.01MF		50V
C44	1-124-910-11	ELECT	47MF	20%	16V						
C45	1-101-004-00	CERAMIC	0.01MF		50V	C313	1-101-004-00	CERAMIC	0.01MF		50V
C46	1-136-153-00	FILM	0.01MF	5%	50V	C316	1-102-935-00	CERAMIC	2PF	0.25PF	50V
C49	1-124-902-00	ELECT	0.47MF	20%	50V	C350	1-102-963-00	CERAMIC	33PF	5%	50V
C50	1-123-382-00	ELECT	3.3MF	20%	50V						
C51	1-109-667-11	MICA	56PF	1%	500V			<TRIMMER>			
C52	1-102-942-00	CERAMIC	5PF	0.5PF	50V						
C53	1-109-621-00	MICA	220PF	1%	500V	CV1	1-141-171-00	CAP,TRIMMER 15P			
C55	1-124-910-11	ELECT	47MF	20%	16V	CV2	1-141-179-12	CAP, VAR, TRIMMER			
C56	1-124-910-11	ELECT	47MF	20%	16V						
C57	1-101-004-00	CERAMIC	0.01MF		50V			<DIODE>			
C58	1-101-004-00	CERAMIC	0.01MF		50V						
C59	1-101-004-00	CERAMIC	0.01MF		50V	D1	8-719-911-19	DIODE 1SS119			
C60	1-124-910-11	ELECT	47MF	20%	16V	D2	8-719-911-19	DIODE 1SS119			
						D4	8-719-109-63	DIODE RD3.0ESB2			
C62	1-102-960-00	CERAMIC	24PF	5%	50V	D5	8-719-110-13	DIODE RD9.1ESB2			
C63	1-101-884-00	CERAMIC	56PF	5%	50V	D6	8-719-911-19	DIODE 1SS119			
C64	1-101-884-00	CERAMIC	56PF	5%	50V						
C65	1-102-951-00	CERAMIC	15PF	5%	50V	D10	8-719-920-95	DIODE 1T25-0			
C66	1-102-965-00	CERAMIC	39PF	5%	50V	D11	8-719-911-19	DIODE 1SS119			
						D12	8-719-110-31	DIODE RD12ESB2			
C67	1-102-935-00	CERAMIC	2PF	0.25PF	50V	D13	8-719-110-31	DIODE RD12ESB2			
C68	1-124-034-51	ELECT	33MF	20%	16V	D16	8-719-911-19	DIODE 1SS119			
C69	1-124-034-51	ELECT	33MF	20%	16V						
C70	1-123-369-00	ELECT	4.7MF	20%	50V	D201	8-719-911-19	DIODE 1SS119			
C71	1-101-004-00	CERAMIC	0.01MF		50V	D202	8-719-911-19	DIODE 1SS119			
C75	1-101-004-00	CERAMIC	0.01MF		50V			<IC>			
C100	1-124-034-51	ELECT	33MF	20%	16V						
C101	1-124-910-11	ELECT	47MF	20%	25V	IC1	8-759-204-21	IC TA7193P			
C102	1-124-034-51	ELECT	33MF	20%	16V						

REF.NO.	PART NO.	DESCRIPTION				REMARK
IC2	8-759-800-81	IC LA7016				
IC3	8-759-246-15	IC TL8608AP				
	*1-526-654-00	SOCKET, IC (DP) 16P; IC3				
IC4	8-759-246-15	IC TL8608AP				
	*1-526-654-00	SOCKET, IC (DP) 16P; IC4				
IC5	8-759-140-53	IC UPD4053BC				
IC6	8-759-800-81	IC LA7016				
IC7	8-759-145-58	IC UPC4558C				
IC8	8-759-145-58	IC UPC4558C				

\<COIL\>

REF.NO.	PART NO.	DESCRIPTION	
L1	1-408-533-00	COIL, VARIABLE	
L2	1-408-532-00	COIL, VARIABLE	
L3	9-910-999-31	COIL (VARIABLE)	
L4	1-408-421-00	INDUCTOR	100UH
L5	1-408-429-00	INDUCTOR	470UH
L6	1-408-429-00	INDUCTOR	470UH
L8	1-408-421-00	INDUCTOR	100UH
L101	1-408-421-00	INDUCTOR	100UH
L102	1-408-421-00	INDUCTOR	100UH

\<TRANSISTOR\>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q4	8-729-800-10	TRANSISTOR 2SC3068
Q5	8-729-800-10	TRANSISTOR 2SC3068
Q6	8-729-384-48	TRANSISTOR 2SA844-E
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q8	8-729-384-48	TRANSISTOR 2SA844-E
Q9	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q10	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q11	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q12	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q13	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q18	8-729-600-19	TRANSISTOR 2SK381-A
Q20	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q21	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q23	8-729-384-48	TRANSISTOR 2SA844-E
Q24	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q25	8-729-800-10	TRANSISTOR 2SC3068
Q26	8-729-600-19	TRANSISTOR 2SK381-A
Q28	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q29	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q30	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q31	8-729-384-48	TRANSISTOR 2SA844-E
Q32	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q33	8-729-800-10	TRANSISTOR 2SC3068
Q34	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q35	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q36	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q38	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q101	8-729-140-97	TRANSISTOR 2SB734-34
Q102	8-729-320-62	TRANSISTOR 2SD789-34
Q103	8-729-900-63	TRANSISTOR DTA124ES
Q104	8-729-900-63	TRANSISTOR DTA124ES

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-249-428-11	CARBON	8.2K	5%	1/4W	
R2	1-249-429-11	CARBON	10K	5%	1/4W	
R3	1-249-422-11	CARBON	2.7K	5%	1/4W	
R4	1-215-425-00	METAL	1.5K	1%	1/4W	
R5	1-215-395-00	METAL	82	1%	1/4W	
R6	1-215-421-00	METAL	1K	1%	1/4W	
R7	1-215-421-00	METAL	1K	1%	1/4W	
R8	1-215-423-00	METAL	1.2K	1%	1/4W	
R9	1-215-421-00	METAL	1K	1%	1/4W	
R10	1-215-421-00	METAL	1K	1%	1/4W	
R11	1-215-391-00	METAL	56	1%	1/4W	
R12	1-215-427-00	METAL	1.8K	1%	1/4W	
R13	1-249-425-11	CARBON	4.7K	5%	1/4W	
R14	1-249-429-11	CARBON	10K	5%	1/4W	
R15	1-249-429-11	CARBON	10K	5%	1/4W	
R17	1-249-433-11	CARBON	22K	5%	1/4W	
R18	1-215-425-00	METAL	1.5K	1%	1/4W	
R19	1-215-425-00	METAL	1.5K	1%	1/4W	
R20	1-215-425-00	METAL	1.5K	1%	1/4W	
R21	1-215-425-00	METAL	1.5K	1%	1/4W	
R22	1-249-405-11	CARBON	100	5%	1/4W	
R23	1-215-441-00	METAL	6.8K	1%	1/4W	
R24	1-215-469-00	METAL	100K	1%	1/4W	
R25	1-249-427-11	CARBON	6.8K	5%	1/4W	
R26	1-249-415-11	CARBON	680	5%	1/4W	
R27	1-249-415-11	CARBON	680	5%	1/4W	
R28	1-249-420-11	CARBON	1.8K	5%	1/4W	
R29	1-249-422-11	CARBON	2.7K	5%	1/4W	
R30	1-249-405-11	CARBON	100	5%	1/4W	
R31	1-247-903-00	CARBON	1M	5%	1/4W	
R32	1-249-429-11	CARBON	10K	5%	1/4W	
R34	1-215-407-00	METAL	270	1%	1/4W	
R35	1-215-407-00	METAL	270	1%	1/4W	
R36	1-215-413-00	METAL	470	1%	1/4W	
R37	1-215-443-00	METAL	8.2K	1%	1/4W	
R38	1-249-441-11	CARBON	100K	5%	1/4W	
R39	1-215-425-00	METAL	1.5K	1%	1/4W	
R40	1-215-421-00	METAL	1K	1%	1/4W	
R41	1-215-429-00	METAL	2.2K	1%	1/4W	
R42	1-215-445-00	METAL	10K	1%	1/4W	
R43	1-215-421-00	METAL	1K	1%	1/4W	
R44	1-249-433-11	CARBON	22K	5%	1/4W	
R45	1-249-429-11	CARBON	10K	5%	1/4W	
R46	1-249-429-11	CARBON	10K	5%	1/4W	
R47	1-249-441-11	CARBON	100K	5%	1/4W	
R48	1-249-425-11	CARBON	4.7K	5%	1/4W	
R54	1-249-422-11	CARBON	2.7K	5%	1/4W	
R55	1-215-418-00	METAL	750	1%	1/4W	
R56	1-215-420-00	METAL	910	1%	1/4W	
R57	1-249-415-11	CARBON	680	5%	1/4W	
R58	1-249-422-11	CARBON	2.7K	5%	1/4W	
R59	1-249-422-11	CARBON	2.7K	5%	1/4W	
R60	1-215-418-00	METAL	750	1%	1/4W	
R61	1-215-420-00	METAL	910	1%	1/4W	
R62	1-249-415-11	CARBON	680	5%	1/4W	
R63	1-249-422-11	CARBON	2.7K	5%	1/4W	
R64	1-215-477-00	METAL	220K	1%	1/4W	
R65	1-215-435-00	METAL	3.9K	1%	1/4W	
R66	1-249-405-11	CARBON	100	5%	1/4W	
R70	1-247-903-00	CARBON	1M	5%	1/4W	
R71	1-249-429-11	CARBON	10K	5%	1/4W	
R72	1-249-429-11	CARBON	10K	5%	1/4W	

BD | BG

REF.NO.	PART NO.	DESCRIPTION				REMARK
R73	1-249-429-11	CARBON	10K	5%	1/4W	
R74	1-249-417-11	CARBON	1K	5%	1/4W	
R75	1-249-427-11	CARBON	6.8K	5%	1/4W	
R76	1-249-427-11	CARBON	6.8K	5%	1/4W	
R77	1-249-425-11	CARBON	4.7K	5%	1/4W	
R78	1-215-424-00	METAL	1.3K	1%	1/4W	
R79	1-215-419-00	METAL	820	1%	1/4W	
R80	1-215-425-00	METAL	1.5K	1%	1/4W	
R81	1-249-422-11	CARBON	2.7K	5%	1/4W	
R82	1-249-425-11	CARBON	4.7K	5%	1/4W	
R83	1-249-435-11	CARBON	33K	5%	1/4W	
R84	1-249-435-11	CARBON	33K	5%	1/4W	
R85	1-247-903-00	CARBON	1M	5%	1/4W	
R86	1-249-429-11	CARBON	10K	5%	1/4W	
R87	1-249-429-11	CARBON	10K	5%	1/4W	
R88	1-249-429-11	CARBON	10K	5%	1/4W	
R89	1-249-417-11	CARBON	1K	5%	1/4W	
R90	1-249-427-11	CARBON	6.8K	5%	1/4W	
R91	1-249-427-11	CARBON	6.8K	5%	1/4W	
R92	1-249-425-11	CARBON	4.7K	5%	1/4W	
R93	1-215-424-00	METAL	1.3K	1%	1/4W	
R94	1-215-419-00	METAL	820	1%	1/4W	
R95	1-215-425-00	METAL	1.5K	1%	1/4W	
R96	1-249-422-11	CARBON	2.7K	5%	1/4W	
R97	1-249-425-11	CARBON	4.7K	5%	1/4W	
R98	1-249-435-11	CARBON	33K	5%	1/4W	
R99	1-249-435-11	CARBON	33K	5%	1/4W	
R100	1-215-438-00	METAL	5.1K	1%	1/4W	
R101	1-215-438-00	METAL	5.1K	1%	1/4W	
R102	1-215-438-00	METAL	5.1K	1%	1/4W	
R103	1-215-438-00	METAL	5.1K	1%	1/4W	
R104	1-249-437-11	CARBON	47K	5%	1/4W	
R105	1-249-438-11	CARBON	56K	5%	1/4W	
R106	1-249-417-11	CARBON	1K	5%	1/4W	
R107	1-249-417-11	CARBON	1K	5%	1/4W	
R108	1-249-417-11	CARBON	1K	5%	1/4W	
R109	1-249-417-11	CARBON	1K	5%	1/4W	
R110	1-249-417-11	CARBON	1K	5%	1/4W	
R115	1-215-438-00	METAL	5.1K	1%	1/4W	
R116	1-215-438-00	METAL	5.1K	1%	1/4W	
R120	1-249-429-11	CARBON	10K	5%	1/4W	
R121	1-249-429-11	CARBON	10K	5%	1/4W	
R130	1-215-477-00	METAL	220K	1%	1/4W	
R150	1-249-441-11	CARBON	100K	5%	1/4W	
R201	1-249-423-11	CARBON	3.3K	5%	1/4W	
R202	1-249-423-11	CARBON	3.3K	5%	1/4W	
R203	1-249-422-11	CARBON	2.7K	5%	1/4W	
R204	1-249-423-11	CARBON	3.3K	5%	1/4W	
R220	1-249-441-11	CARBON	100K	5%	1/4W	
R221	1-249-433-11	CARBON	22K	5%	1/4W	
R222	1-249-433-11	CARBON	22K	5%	1/4W	
R250	1-215-415-00	METAL	560	1%	1/4W	
R251	1-215-415-00	METAL	560	1%	1/4W	
R252	1-215-421-00	METAL	1K	1%	1/4W	
R254	1-249-429-11	CARBON	10K	5%	1/4W	
R255	1-249-441-11	CARBON	100K	5%	1/4W	
R259	1-215-421-00	METAL	1K	1%	1/4W	
R301	1-215-469-00	METAL	100K	1%	1/4W	
R302	1-215-491-00	METAL	820K	1%	1/4W	
R303	1-249-418-11	CARBON	1.2K	5%	1/4W	
R305	1-249-431-11	CARBON	15K	5%	1/4W	
R306	1-249-428-11	CARBON	8.2K	5%	1/4W	
R307	1-249-417-11	CARBON	1K	5%	1/4W	
R308	1-249-417-11	CARBON	1K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R310	1-249-422-11	CARBON	2.7K	5%	1/4W	
R314	1-215-417-00	METAL	680	1%	1/4W	
R315	1-249-422-11	CARBON	2.7K	5%	1/4W	
R316	1-249-413-11	CARBON	470	5%	1/4W	
R317	1-249-413-11	CARBON	470	5%	1/4W	
R320	1-215-472-00	METAL	130K	1%	1/4W	
R353	1-249-432-11	CARBON	18K	5%	1/4W	
R354	1-249-432-11	CARBON	18K	5%	1/4W	
R400	1-215-429-00	METAL	2.2K	1%	1/4W	

\<VARIABLE RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION	
RV1	1-237-515-21	RES, ADJ, CERMET	1K
RV2	1-237-499-21	RES, ADJ, CERMET	500
RV3	1-237-501-21	RES, ADJ, CERMET	2K
RV4	1-237-501-21	RES, ADJ, CERMET	2K
RV5	1-237-517-21	RES, ADJ, CERMET	5K
RV6	1-237-517-21	RES, ADJ, CERMET	5K
RV7	1-237-504-21	RES, ADJ, CERMET	20K
RV8	1-237-504-21	RES, ADJ, CERMET	20K
RV9	1-237-517-21	RES, ADJ, CERMET	5K
RV10	1-237-517-21	RES, ADJ, CERMET	5K

\<CRYSTAL\>

REF.NO.	PART NO.	DESCRIPTION
X1	1-567-504-11	OSCILLATOR, CRYSTAL
X2	1-567-409-11	VIBRATOR, CRYSTAL

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      *A-1135-358-A  BG BOARD, COMPLETE
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      *4-353-708-00  HOOK, FINGER
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\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-124-910-11	ELECT	47MF	20%	16V	
C2	1-124-910-11	ELECT	47MF	20%	16V	
C3	1-124-915-11	ELECT	10MF	20%	16V	
C4	1-124-910-11	ELECT	47MF	20%	16V	
C7	1-101-004-00	CERAMIC	0.01MF		50V	
C8	1-101-004-00	CERAMIC	0.01MF		50V	
C9	1-101-004-00	CERAMIC	0.01MF		50V	
C10	1-102-935-00	CERAMIC	2PF	0.25PF	50V	
C12	1-101-004-00	CERAMIC	0.01MF		50V	
C16	1-101-004-00	CERAMIC	0.01MF		50V	
C20	1-124-903-11	ELECT	1MF	20%	50V	
C22	1-101-004-00	CERAMIC	0.01MF		50V	
C26	1-101-004-00	CERAMIC	0.01MF		50V	
C32	1-101-004-00	CERAMIC	0.01MF		50V	
C33	1-136-165-00	FILM	0.1MF	5%	50V	
C34	1-136-165-00	FILM	0.1MF	5%	50V	
C35	1-136-165-00	FILM	0.1MF	5%	50V	
C41	1-102-942-00	CERAMIC	5PF	1PF	50V	
C42	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C44	1-102-936-00	CERAMIC	3PF	0.25PF	50V	
C45	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C47	1-124-915-11	ELECT	10MF	20%	16V	
C53	1-124-915-11	ELECT	10MF	20%	25V	
C54	1-101-004-00	CERAMIC	0.01MF		50V	
C55	1-102-976-00	CERAMIC	180PF	5%	50V	
C56	1-102-976-00	CERAMIC	180PF	5%	50V	
C101	1-126-103-11	ELECT	470MF	20%	16V	
C102	1-124-034-51	ELECT	33MF	20%	16V	

REF.NO.	PART NO.	DESCRIPTION			REMARK
C103	1-124-119-00	ELECT	330MF	20%	16V
C105	1-126-103-11	ELECT	470MF	20%	16V
C106	1-124-034-51	ELECT	33MF	20%	16V
C111	1-124-915-11	ELECT	10MF	20%	16V
C112	1-101-004-00	CERAMIC	0.01MF		50V
C113	1-101-004-00	CERAMIC	0.01MF		50V
C114	1-101-004-00	CERAMIC	0.01MF		50V
C115	1-101-004-00	CERAMIC	0.01MF		50V
C116	1-101-004-00	CERAMIC	0.01MF		50V
C117	1-101-004-00	CERAMIC	0.01MF		50V
C131	1-126-103-11	ELECT	470MF	20%	16V
C132	1-124-034-51	ELECT	33MF	20%	16V
C133	1-124-119-00	ELECT	330MF	20%	16V
C135	1-126-103-11	ELECT	470MF	20%	16V
C136	1-124-034-51	ELECT	33MF	20%	16V
C141	1-101-004-00	CERAMIC	0.01MF		50V
C142	1-101-004-00	CERAMIC	0.01MF		50V
C143	1-101-004-00	CERAMIC	0.01MF		50V
C144	1-101-004-00	CERAMIC	0.01MF		50V
C145	1-101-004-00	CERAMIC	0.01MF		50V
C146	1-101-004-00	CERAMIC	0.01MF		50V
C147	1-101-004-00	CERAMIC	0.01MF		50V

<COMPOSITION CIRCUIT BLOCK>

REF.NO.	PART NO.	DESCRIPTION
CP11	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP12	1-232-728-11	COMPOSITION CIRCUIT BLOCK
CP13	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP14	1-233-018-11	COMPOSITION CIRCUIT BLOCK
CP15	1-233-019-11	COMPOSITION CIRCUIT BLOCK
CP16	1-233-031-11	COMPOSITION CIRCUIT BLOCK
CP17	1-233-032-11	COMPOSITION CIRCUIT BLOCK
CP18	1-233-013-11	COMPOSITION CIRCUIT BLOCK
CP19	1-233-017-11	COMPOSITION CIRCUIT BLOCK
CP20	1-232-752-11	COMPOSITION CIRCUIT BLOCK
CP21	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP22	1-232-728-11	COMPOSITION CIRCUIT BLOCK
CP23	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP25	1-232-730-11	COMPOSITION CIRCUIT BLOCK
CP26	1-232-730-11	COMPOSITION CIRCUIT BLOCK
CP27	1-231-765-00	COMPOSITION CIRCUIT BLOCK
CP28	1-232-752-11	COMPOSITION CIRCUIT BLOCK
CP29	1-232-728-11	COMPOSITION CIRCUIT BLOCK
CP30	1-232-728-11	COMPOSITION CIRCUIT BLOCK
CP31	1-232-734-11	COMPOSITION CIRCUIT BLOCK
CP32	1-232-728-11	COMPOSITION CIRCUIT BLOCK
CP33	1-232-738-11	COMPOSITION CIRCUIT BLOCK
CP41	1-233-014-11	COMPOSITION CIRCUIT BLOCK
CP42	1-233-014-11	COMPOSITION CIRCUIT BLOCK
CP51	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP52	1-232-727-11	COMPOSITION CIRCUIT BLOCK
CP53	1-232-728-11	COMPOSITION CIRCUIT BLOCK
CP54	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP55	1-232-727-11	COMPOSITION CIRCUIT BLOCK
CP56	1-232-728-11	COMPOSITION CIRCUIT BLOCK

<TRIMMER>

REF.NO.	PART NO.	DESCRIPTION	
CV2	1-141-181-11	CAP, TRIMMER	
CV3	1-141-171-00	CAP, TRIMMER	20P

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D3	8-719-016-42	DIODE MC932
D4	8-719-016-42	DIODE MC932
D5	8-719-911-19	DIODE 1SS119
D6	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119
D8	8-719-109-93	DIODE RD6.2ESB2
D11	8-719-911-19	DIODE 1SS119
D12	8-719-911-19	DIODE 1SS119
D13	8-719-911-19	DIODE 1SS119
D14	8-719-911-19	DIODE 1SS119
D16	8-719-911-19	DIODE 1SS119
D17	8-719-911-19	DIODE 1SS119

<DELAY LINE>

REF.NO.	PART NO.	DESCRIPTION
DL1	1-415-477-11	DELAY LINE
DL2	1-415-458-11	DELAY LINE
DL3	1-415-490-11	DELAY LINE
DL4	1-415-490-11	DELAY LINE

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-800-81	IC LA7016
IC2	8-766-001-49	TRANSISTOR TX-429M
IC3	8-759-145-58	IC UPC4558C
IC4	8-757-182-14	IC CX-718D-1
IC5	8-759-140-53	IC UPD4053BC
IC6	8-759-140-53	IC UPD4053BC
IC7	8-759-990-82	IC TL082CP
IC8	8-759-990-82	IC TL082CP
IC9	8-759-990-82	IC TL082CP

<COIL>

REF.NO.	PART NO.	DESCRIPTION	
L2	1-408-408-00	INDUCTOR	8.2UH

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q5	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q9	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q10	8-729-384-48	TRANSISTOR 2SA844-E
Q11	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q12	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q13	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q14	8-729-800-10	TRANSISTOR 2SC3068
Q21	8-729-384-48	TRANSISTOR 2SA844-E
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q23	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q24	8-729-600-19	TRANSISTOR 2SK381-A
Q25	8-729-384-48	TRANSISTOR 2SA844-E
Q26	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q27	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q28	8-729-600-19	TRANSISTOR 2SK381-A
Q29	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q30	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q31	8-729-384-48	TRANSISTOR 2SA844-E
Q32	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q33	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q34	8-729-600-19	TRANSISTOR 2SK381-A
Q35	8-729-384-48	TRANSISTOR 2SA844-E

REF.NO.	PART NO.	DESCRIPTION				REMARK
Q36	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q37	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q38	8-729-600-19	TRANSISTOR 2SK381-A				
Q39	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q40	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q41	8-729-384-48	TRANSISTOR 2SA844-E				
Q42	8-729-384-48	TRANSISTOR 2SA844-E				
Q43	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q44	8-729-384-48	TRANSISTOR 2SA844-E				
Q45	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q49	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q50	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q51	8-729-900-63	TRANSISTOR DTA124ES				
Q52	8-729-900-63	TRANSISTOR DTA124ES				
Q53	8-729-900-63	TRANSISTOR DTA124ES				
Q54	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q55	8-729-600-19	TRANSISTOR 2SK381-A				
Q56	8-729-900-63	TRANSISTOR DTA124ES				
Q57	8-729-900-63	TRANSISTOR DTA124ES				
Q58	8-729-900-63	TRANSISTOR DTA124ES				
Q59	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q60	8-729-600-19	TRANSISTOR 2SK381-A				
Q71	8-729-384-48	TRANSISTOR 2SA844-E				
Q72	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q73	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q74	8-729-384-48	TRANSISTOR 2SA844-E				
Q75	8-729-800-10	TRANSISTOR 2SC3068				
Q76	8-729-900-63	TRANSISTOR DTA124ES				
Q77	8-729-900-63	TRANSISTOR DTA124ES				
Q78	8-729-900-89	TRANSISTOR DTC144ES				
Q81	8-729-384-48	TRANSISTOR 2SA844-E				
Q82	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q83	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q84	8-729-384-48	TRANSISTOR 2SA844-E				
Q85	8-729-800-10	TRANSISTOR 2SC3068				

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-249-405-11	CARBON	100	5%	1/4W	
R2	1-215-396-00	METAL	91	1%	1/4W	
R3	1-215-431-00	METAL	2.7K	1%	1/4W	
R4	1-249-419-11	CARBON	1.5K	5%	1/4W	
R6	1-249-405-11	CARBON	100	5%	1/4W	
R7	1-249-405-11	CARBON	100	5%	1/4W	
R8	1-249-429-11	CARBON	10K	5%	1/4W	
R10	1-247-830-11	CARBON	910	5%	1/4W	
R11	1-249-417-11	CARBON	1K	5%	1/4W	
R12	1-249-417-11	CARBON	1K	5%	1/4W	
R13	1-215-462-00	METAL	51K	1%	1/4W	
R14	1-249-426-11	CARBON	5.6K	5%	1/4W	
R15	1-247-903-00	CARBON	1M	5%	1/4W	
R16	1-215-477-00	METAL	220K	1%	1/4W	
R17	1-249-429-11	CARBON	10K	5%	1/4W	
R18	1-249-429-11	CARBON	10K	5%	1/4W	
R19	1-249-417-11	CARBON	1K	5%	1/4W	
R20	1-215-421-00	METAL	1K	1%	1/4W	
R21	1-215-421-00	METAL	1K	1%	1/4W	
R22	1-249-441-11	CARBON	100K	5%	1/4W	
R23	1-215-409-00	METAL	330	1%	1/4W	
R24	1-215-380-00	METAL	20	1%	1/4W	
R25	1-215-380-00	METAL	20	1%	1/4W	
R26	1-215-409-00	METAL	330	1%	1/4W	
R27	1-249-429-11	CARBON	10K	5%	1/4W	
R28	1-249-417-11	CARBON	1K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R29	1-215-418-00	METAL	750	1%	1/4W	
R30	1-249-422-11	CARBON	2.7K	5%	1/4W	
R31	1-249-405-11	CARBON	100	5%	1/4W	
R32	1-249-420-11	CARBON	1.8K	5%	1/4W	
R33	1-249-429-11	CARBON	10K	5%	1/4W	
R34	1-249-428-11	CARBON	8.2K	5%	1/4W	
R35	1-249-417-11	CARBON	1K	5%	1/4W	
R36	1-249-422-11	CARBON	2.7K	5%	1/4W	
R37	1-249-405-11	CARBON	100	5%	1/4W	
R40	1-249-425-11	CARBON	4.7K	5%	1/4W	
R41	1-249-422-11	CARBON	2.7K	5%	1/4W	
R42	1-249-417-11	CARBON	1K	5%	1/4W	
R43	1-249-417-11	CARBON	1K	5%	1/4W	
R44	1-249-431-11	CARBON	15K	5%	1/4W	
R45	1-249-423-11	CARBON	3.3K	5%	1/4W	
R46	1-249-417-11	CARBON	1K	5%	1/4W	
R47	1-249-423-11	CARBON	3.3K	5%	1/4W	
R48	1-249-422-11	CARBON	2.7K	5%	1/4W	
R49	1-249-405-11	CARBON	100	5%	1/4W	
R50	1-249-422-11	CARBON	2.7K	5%	1/4W	
R51	1-247-903-00	CARBON	1M	5%	1/4W	
R52	1-247-866-11	CARBON	30K	5%	1/4W	
R53	1-215-445-00	METAL	10K	1%	1/4W	
R54	1-249-420-11	CARBON	1.8K	5%	1/4W	
R55	1-249-422-11	CARBON	2.7K	5%	1/4W	
R56	1-249-405-11	CARBON	100	5%	1/4W	
R57	1-249-422-11	CARBON	2.7K	5%	1/4W	
R58	1-249-422-11	CARBON	2.7K	5%	1/4W	
R59	1-249-422-11	CARBON	2.7K	5%	1/4W	
R61	1-249-422-11	CARBON	2.7K	5%	1/4W	
R62	1-249-417-11	CARBON	1K	5%	1/4W	
R63	1-249-417-11	CARBON	1K	5%	1/4W	
R64	1-249-431-11	CARBON	15K	5%	1/4W	
R65	1-249-423-11	CARBON	3.3K	5%	1/4W	
R66	1-249-417-11	CARBON	1K	5%	1/4W	
R67	1-249-423-11	CARBON	3.3K	5%	1/4W	
R68	1-249-422-11	CARBON	2.7K	5%	1/4W	
R69	1-249-405-11	CARBON	100	5%	1/4W	
R70	1-249-422-11	CARBON	2.7K	5%	1/4W	
R71	1-247-903-00	CARBON	1M	5%	1/4W	
R72	1-247-866-11	CARBON	30K	5%	1/4W	
R73	1-215-445-00	METAL	10K	1%	1/4W	
R74	1-249-420-11	CARBON	1.8K	5%	1/4W	
R75	1-249-422-11	CARBON	2.7K	5%	1/4W	
R76	1-249-405-11	CARBON	100	5%	1/4W	
R77	1-249-422-11	CARBON	2.7K	5%	1/4W	
R78	1-249-422-11	CARBON	2.7K	5%	1/4W	
R79	1-249-422-11	CARBON	2.7K	5%	1/4W	
R80	1-249-405-11	CARBON	100	5%	1/4W	
R81	1-249-422-11	CARBON	2.7K	5%	1/4W	
R82	1-247-903-00	CARBON	1M	5%	1/4W	
R83	1-249-420-11	CARBON	1.8K	5%	1/4W	
R84	1-249-405-11	CARBON	100	5%	1/4W	
R85	1-247-866-11	CARBON	30K	5%	1/4W	
R86	1-215-445-00	METAL	10K	1%	1/4W	
R87	1-249-422-11	CARBON	2.7K	5%	1/4W	
R88	1-215-430-00	METAL	2.4K	1%	1/4W	
R89	1-215-443-00	METAL	8.2K	1%	1/4W	
R90	1-249-430-11	CARBON	12K	5%	1/4W	
R91	1-249-405-11	CARBON	100	5%	1/4W	
R92	1-247-830-11	CARBON	910	5%	1/4W	
R93	1-215-421-00	METAL	1K	1%	1/4W	
R94	1-249-422-11	CARBON	2.7K	5%	1/4W	
R98	1-249-422-11	CARBON	2.7K	5%	1/4W	

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION				REMARK
R99	1-249-422-11	CARBON	2.7K	5%	1/4W	
R101	1-249-432-11	CARBON	18K	5%	1/4W	
R102	1-249-421-11	CARBON	2.2K	5%	1/4W	
R103	1-249-421-11	CARBON	2.2K	5%	1/4W	
R104	1-249-421-11	CARBON	2.2K	5%	1/4W	
R105	1-249-433-11	CARBON	22K	5%	1/4W	
R106	1-249-429-11	CARBON	10K	5%	1/4W	
R107	1-249-429-11	CARBON	10K	5%	1/4W	
R108	1-249-405-11	CARBON	100	5%	1/4W	
R109	1-249-422-11	CARBON	2.7K	5%	1/4W	
R110	1-249-405-11	CARBON	100	5%	1/4W	
R111	1-249-435-11	CARBON	33K	5%	1/4W	
R112	1-249-421-11	CARBON	2.2K	5%	1/4W	
R113	1-249-421-11	CARBON	2.2K	5%	1/4W	
R114	1-249-421-11	CARBON	2.2K	5%	1/4W	
R115	1-249-433-11	CARBON	22K	5%	1/4W	
R116	1-249-429-11	CARBON	10K	5%	1/4W	
R117	1-249-429-11	CARBON	10K	5%	1/4W	
R118	1-249-405-11	CARBON	100	5%	1/4W	
R119	1-249-422-11	CARBON	2.7K	5%	1/4W	
R120	1-249-405-11	CARBON	100	5%	1/4W	
R161	1-215-438-00	METAL	5.1K	1%	1/4W	
R162	1-249-431-11	CARBON	15K	5%	1/4W	
R163	1-249-417-11	CARBON	1K	5%	1/4W	
R164	1-215-435-00	METAL	3.9K	1%	1/4W	
R165	1-249-422-11	CARBON	2.7K	5%	1/4W	
R166	1-249-422-11	CARBON	2.7K	5%	1/4W	
R167	1-215-413-00	METAL	470	1%	1/4W	
R168	1-215-416-00	METAL	620	1%	1/4W	
R169	1-215-432-00	METAL	3K	1%	1/4W	
R170	1-249-425-11	CARBON	4.7K	5%	1/4W	
R171	1-215-436-00	METAL	4.3K	1%	1/4W	
R172	1-249-431-11	CARBON	15K	5%	1/4W	
R173	1-249-417-11	CARBON	1K	5%	1/4W	
R174	1-215-435-00	METAL	3.9K	1%	1/4W	
R175	1-249-422-11	CARBON	2.7K	5%	1/4W	
R176	1-249-422-11	CARBON	2.7K	5%	1/4W	
R177	1-215-413-00	METAL	470	1%	1/4W	
R178	1-215-418-00	METAL	750	1%	1/4W	
R179	1-215-425-00	METAL	1.5K	1%	1/4W	
R180	1-249-425-11	CARBON	4.7K	5%	1/4W	
R181	1-215-384-00	METAL	30	1%	1/4W	
R182	1-215-384-00	METAL	30	1%	1/4W	
R183	1-249-433-11	CARBON	22K	5%	1/4W	
R184	1-249-425-11	CARBON	4.7K	5%	1/4W	
R185	1-249-429-11	CARBON	10K	5%	1/4W	
R201	1-249-437-11	CARBON	47K	5%	1/4W	
R202	1-249-429-11	CARBON	10K	5%	1/4W	
R203	1-249-435-11	CARBON	33K	5%	1/4W	
R204	1-247-872-11	CARBON	51K	5%	1/4W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION
RV1	1-237-514-21	RES, ADJ, CERMET 500
RV2	1-237-508-21	RES, ADJ, CERMET 500K
RV3	1-237-498-21	RES, ADJ, CERMET 200
RV4	1-237-500-21	RES, ADJ, CERMET 1K
RV5	1-237-500-21	RES, ADJ, CERMET 1K
RV11	1-237-519-21	RES, ADJ, CERMET 20K
RV12	1-237-519-21	RES, ADJ, CERMET 20K
RV13	1-237-519-21	RES, ADJ, CERMET 20K
RV14	1-237-519-21	RES, ADJ, CERMET 20K
RV15	1-237-519-21	RES, ADJ, CERMET 20K
RV16	1-237-519-21	RES, ADJ, CERMET 20K

REF.NO.	PART NO.	DESCRIPTION				REMARK
RV21	1-237-517-21	RES, ADJ, CERMET 5K				
RV22	1-237-517-21	RES, ADJ, CERMET 5K				

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION
SI	1-570-857-11	SWITCH, SLIDE

****

*A-1135-359-A   BH BOARD, COMPLETE
****

*4-353-708-00   HOOK; FINGER

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-124-034-51	ELECT	33MF	20%	16V	
C2	1-124-034-51	ELECT	33MF	20%	16V	
C3	1-124-034-51	ELECT	33MF	20%	16V	
C4	1-124-034-51	ELECT	33MF	20%	16V	
C5	1-124-034-51	ELECT	33MF	20%	16V	
C6	1-124-034-51	ELECT	33MF	20%	16V	
C7	1-124-034-51	ELECT	33MF	20%	16V	
C8	1-124-034-51	ELECT	33MF	20%	16V	
C9	1-124-034-51	ELECT	33MF	20%	16V	
C10	1-124-034-51	ELECT	33MF	20%	16V	
C11	1-124-034-51	ELECT	33MF	20%	16V	
C12	1-124-034-51	ELECT	33MF	20%	16V	
C13	1-124-034-51	ELECT	33MF	20%	16V	
C14	1-124-034-51	ELECT	33MF	20%	16V	
C15	1-101-004-00	CERAMIC	0.01MF		50V	
C16	1-101-004-00	CERAMIC	0.01MF		50V	
C17	1-101-004-00	CERAMIC	0.01MF		50V	
C18	1-101-004-00	CERAMIC	0.01MF		50V	
C20	1-123-382-00	ELECT	3.3MF	20%	50V	
C21	1-124-915-11	ELECT	10MF	20%	16V	
C22	1-124-915-11	ELECT	10MF	20%	16V	
C23	1-124-915-11	ELECT	10MF	20%	16V	
C24	1-124-915-11	ELECT	10MF	20%	16V	
C26	1-101-004-00	CERAMIC	0.01MF		50V	
C41	1-124-122-11	ELECT	100MF	20%	16V	
C42	1-124-915-11	ELECT	10MF	20%	16V	
C43	1-124-915-11	ELECT	10MF	20%	16V	
C44	1-124-915-11	ELECT	10MF	20%	16V	
C45	1-124-915-11	ELECT	10MF	20%	16V	
C50	1-124-915-11	ELECT	10MF	20%	16V	
C51	1-101-004-00	CERAMIC	0.01MF		50V	
C52	1-101-004-00	CERAMIC	0.01MF		50V	
C53	1-101-004-00	CERAMIC	0.01MF		50V	
C54	1-101-004-00	CERAMIC	0.01MF		50V	
C55	1-101-004-00	CERAMIC	0.01MF		50V	
C71	1-124-122-11	ELECT	100MF	20%	16V	
C72	1-124-915-11	ELECT	10MF	20%	16V	
C73	1-124-915-11	ELECT	10MF	20%	16V	
C74	1-124-915-11	ELECT	10MF	20%	16V	
C80	1-124-915-11	ELECT	10MF	20%	16V	
C81	1-101-004-00	CERAMIC	0.01MF		50V	
C82	1-101-004-00	CERAMIC	0.01MF		50V	
C83	1-101-004-00	CERAMIC	0.01MF		50V	
C84	1-101-004-00	CERAMIC	0.01MF		50V	
C85	1-101-004-00	CERAMIC	0.01MF		50V	
C86	1-101-004-00	CERAMIC	0.01MF		50V	
C101	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C102	1-102-942-00	CERAMIC	5PF	0.5PF	50V	
C103	1-102-959-00	CERAMIC	22PF	5%	50V	

REF.NO.	PART NO.	DESCRIPTION				REMARK
C104	1-124-915-11	ELECT	10MF	20%	16V	
C105	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C106	1-101-004-00	CERAMIC	0.01MF		50V	
C107	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C108	1-101-004-00	CERAMIC	0.01MF		50V	
C109	1-101-004-00	CERAMIC	0.01MF		50V	
C110	1-101-880-00	CERAMIC	47PF	5%	50V	
C201	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C202	1-102-942-00	CERAMIC	5PF	0.5PF	50V	
C203	1-102-959-00	CERAMIC	22PF	5%	50V	
C204	1-124-915-11	ELECT	10MF	20%	16V	
C205	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C206	1-101-004-00	CERAMIC	0.01MF		50V	
C207	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C208	1-101-004-00	CERAMIC	0.01MF		50V	
C209	1-101-004-00	CERAMIC	0.01MF		50V	
C210	1-101-880-00	CERAMIC	47PF	5%	50V	
C301	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C302	1-102-942-00	CERAMIC	5PF	0.5PF	50V	
C303	1-102-959-00	CERAMIC	22PF	5%	50V	
C304	1-124-915-11	ELECT	10MF	20%	16V	
C305	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C306	1-101-004-00	CERAMIC	0.01MF		50V	
C307	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C308	1-101-004-00	CERAMIC	0.01MF		50V	
C309	1-101-004-00	CERAMIC	0.01MF		50V	
C310	1-101-880-00	CERAMIC	47PF	5%	50V	

\<COMPOSITION CIRCUIT BLOCK\>

REF.NO.	PART NO.	DESCRIPTION
CP1	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP2	1-232-727-11	COMPOSITION CIRCUIT BLOCK
CP3	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP5	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP7	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP9	1-232-735-11	COMPOSITION CIRCUIT BLOCK
CP10	1-231-760-00	COMPOSITION CIRCUIT BLOCK
CP12	1-232-735-11	COMPOSITION CIRCUIT BLOCK
CP13	1-231-760-00	COMPOSITION CIRCUIT BLOCK
CP15	1-232-735-11	COMPOSITION CIRCUIT BLOCK
CP16	1-232-749-11	COMPOSITION CIRCUIT BLOCK
CP17	1-232-096-00	COMPOSITION CIRCUIT BLOCK
CP18	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP19	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP20	1-232-736-11	COMPOSITION CIRCUIT BLOCK
CP21	1-232-736-11	COMPOSITION CIRCUIT BLOCK
CP22	1-232-745-11	COMPOSITION CIRCUIT BLOCK
CP23	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP24	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP25	1-233-144-11	COMPOSITION CIRCUIT BLOCK
CP26	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP27	1-232-177-00	COMPOSITION CIRCUIT BLOCK
CP28	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP29	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP30	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP31	1-233-011-11	COMPOSITION CIRCUIT BLOCK
CP32	1-232-737-11	COMPOSITION CIRCUIT BLOCK
CP33	1-231-938-00	COMPOSITION CIRCUIT BLOCK
CP101	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP102	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP103	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP104	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP201	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP202	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP203	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP204	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP301	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP302	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP303	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP304	1-232-726-11	COMPOSITION CIRCUIT BLOCK

\<DIODE\>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-911-19	DIODE 1SS119
D101	8-719-911-19	DIODE 1SS119
D102	8-719-911-19	DIODE 1SS119
D201	8-719-911-19	DIODE 1SS119
D202	8-719-911-19	DIODE 1SS119
D301	8-719-911-19	DIODE 1SS119
D302	8-719-911-19	DIODE 1SS119

\<IC\>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-140-53	IC UPD4053BC
IC2	8-759-140-53	IC UPD4053BC
IC3	8-759-140-53	IC UPD4053BC
IC4	8-759-140-53	IC UPD4053BC
IC5	8-759-700-08	IC NJM4558S
IC6	8-759-700-08	IC NJM4558S
IC7	8-759-800-81	IC LA7016
IC8	8-759-800-81	IC LA7016
IC9	8-759-140-53	IC UPD4053BC
IC10	8-759-140-53	IC UPD4053BC
IC11	8-759-240-81	IC TC4081BP
IC12	8-759-240-81	IC TC4081BP
IC13	8-759-040-01	IC MC14001BCP
IC14	8-759-207-73	IC TC4030BPHB
IC101	8-766-001-49	TRANSISTOR TX-429M
IC102	8-759-990-82	IC TL082CP
IC201	8-766-001-49	TRANSISTOR TX-429M
IC202	8-759-990-82	IC TL082CP
IC301	8-766-001-49	TRANSISTOR TX-429M
IC302	8-759-990-82	IC TL082CP

\<TRANSISTOR\>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q2	8-729-105-71	TRANSISTOR 2SK523-K2
Q3	8-729-384-48	TRANSISTOR 2SA844-E
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q5	8-729-105-71	TRANSISTOR 2SK523-K2
Q6	8-729-384-48	TRANSISTOR 2SA844-E
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q8	8-729-105-71	TRANSISTOR 2SK523-K2
Q9	8-729-384-48	TRANSISTOR 2SA844-E
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q11	8-729-105-71	TRANSISTOR 2SK523-K2
Q12	8-729-384-48	TRANSISTOR 2SA844-E
Q13	8-729-384-48	TRANSISTOR 2SA844-E
Q14	8-729-384-48	TRANSISTOR 2SA844-E
Q15	8-729-384-48	TRANSISTOR 2SA844-E
Q16	8-729-800-10	TRANSISTOR 2SC3068
Q101	8-729-600-19	TRANSISTOR 2SK381-A
Q102	8-729-384-48	TRANSISTOR 2SA844-E
Q103	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q104	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q105	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q106	8-729-600-19	TRANSISTOR 2SK381-A

REF.NO.	PART NO.	DESCRIPTION			REMARK
Q107	8-729-600-19	TRANSISTOR 2SK381-A			
Q108	8-729-600-19	TRANSISTOR 2SK381-A			
Q201	8-729-600-19	TRANSISTOR 2SK381-A			
Q202	8-729-384-48	TRANSISTOR 2SA844-E			
Q203	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q204	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q205	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q206	8-729-600-19	TRANSISTOR 2SK381-A			
Q207	8-729-600-19	TRANSISTOR 2SK381-A			
Q208	8-729-600-19	TRANSISTOR 2SK381-A			
Q301	8-729-600-19	TRANSISTOR 2SK381-A			
Q302	8-729-384-48	TRANSISTOR 2SA844-E			
Q303	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q304	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q305	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q306	8-729-600-19	TRANSISTOR 2SK381-A			
Q307	8-729-600-19	TRANSISTOR 2SK381-A			
Q308	8-729-600-19	TRANSISTOR 2SK381-A			

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-249-433-11	CARBON	22K	5%	1/4W	
R3	1-249-427-11	CARBON	6.8K	5%	1/4W	
R5	1-249-422-11	CARBON	2.7K	5%	1/4W	
R6	1-249-433-11	CARBON	22K	5%	1/4W	
R7	1-249-433-11	CARBON	22K	5%	1/4W	
R9	1-249-427-11	CARBON	6.8K	5%	1/4W	
R11	1-249-422-11	CARBON	2.7K	5%	1/4W	
R12	1-249-433-11	CARBON	22K	5%	1/4W	
R13	1-249-433-11	CARBON	22K	5%	1/4W	
R15	1-249-427-11	CARBON	6.8K	5%	1/4W	
R17	1-249-422-11	CARBON	2.7K	5%	1/4W	
R18	1-249-433-11	CARBON	22K	5%	1/4W	
R19	1-249-433-11	CARBON	22K	5%	1/4W	
R21	1-249-427-11	CARBON	6.8K	5%	1/4W	
R23	1-249-422-11	CARBON	2.7K	5%	1/4W	
R31	1-249-405-11	CARBON	100	5%	1/4W	
R32	1-249-405-11	CARBON	100	5%	1/4W	
R33	1-249-433-11	CARBON	22K	5%	1/4W	
R34	1-249-422-11	CARBON	2.7K	5%	1/4W	
R35	1-249-405-11	CARBON	100	5%	1/4W	
R36	1-249-405-11	CARBON	100	5%	1/4W	
R37	1-249-433-11	CARBON	22K	5%	1/4W	
R38	1-249-422-11	CARBON	2.7K	5%	1/4W	
R39	1-249-433-11	CARBON	22K	5%	1/4W	
R40	1-249-422-11	CARBON	2.7K	5%	1/4W	
R52	1-249-417-11	CARBON	1K	5%	1/4W	
R53	1-249-425-11	CARBON	4.7K	5%	1/4W	
R54	1-249-441-11	CARBON	100K	5%	1/4W	
R63	1-249-417-11	CARBON	1K	5%	1/4W	
R64	1-249-437-11	CARBON	47K	5%	1/4W	
R65	1-249-433-11	CARBON	22K	5%	1/4W	
R66	1-249-417-11	CARBON	1K	5%	1/4W	
R101	1-247-903-00	CARBON	1M	5%	1/4W	
R102	1-249-431-11	CARBON	15K	5%	1/4W	
R103	1-249-419-11	CARBON	1.5K	5%	1/4W	
R104	1-249-430-11	CARBON	12K	5%	1/4W	
R105	1-249-409-11	CARBON	220	5%	1/4W	
R106	1-249-419-11	CARBON	1.5K	5%	1/4W	
R107	1-215-425-00	METAL	1.5K	1%	1/4W	
R108	1-249-415-11	CARBON	680	5%	1/4W	
R109	1-249-419-11	CARBON	1.5K	5%	1/4W	
R110	1-215-427-00	METAL	1.8K	1%	1/4W	
R111	1-215-453-00	METAL	22K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R112	1-249-419-11	CARBON	1.5K	5%	1/4W	
R113	1-249-405-11	CARBON	100	5%	1/4W	
R114	1-215-445-00	METAL	10K	1%	1/4W	
R115	1-215-445-00	METAL	10K	1%	1/4W	
R116	1-249-429-11	CARBON	10K	5%	1/4W	
R117	1-215-493-00	METAL	1M	1%	1/4W	
R120	1-215-451-00	METAL	18K	1%	1/4W	
R121	1-215-453-00	METAL	22K	1%	1/4W	
R201	1-247-903-00	CARBON	1M	5%	1/4W	
R202	1-249-431-11	CARBON	15K	5%	1/4W	
R203	1-249-419-11	CARBON	1.5K	5%	1/4W	
R204	1-249-430-11	CARBON	12K	5%	1/4W	
R205	1-249-409-11	CARBON	220	5%	1/4W	
R206	1-249-419-11	CARBON	1.5K	5%	1/4W	
R207	1-215-425-00	METAL	1.5K	5%	1/4W	
R208	1-249-415-11	CARBON	680	5%	1/4W	
R209	1-249-419-11	CARBON	1.5K	5%	1/4W	
R210	1-215-427-00	METAL	1.8K	1%	1/4W	
R211	1-215-453-00	METAL	22K	1%	1/4W	
R212	1-249-419-11	CARBON	1.5K	5%	1/4W	
R213	1-249-405-11	CARBON	100	5%	1/4W	
R214	1-215-445-00	METAL	10K	1%	1/4W	
R215	1-215-445-00	METAL	10K	1%	1/4W	
R216	1-249-429-11	CARBON	10K	5%	1/4W	
R217	1-215-455-00	METAL	27K	1%	1/4W	
R301	1-247-903-00	CARBON	1M	5%	1/4W	
R302	1-249-431-11	CARBON	15K	5%	1/4W	
R303	1-249-419-11	CARBON	1.5K	5%	1/4W	
R304	1-249-430-11	CARBON	12K	5%	1/4W	
R305	1-249-409-11	CARBON	220	5%	1/4W	
R306	1-249-419-11	CARBON	1.5K	5%	1/4W	
R307	1-215-425-00	METAL	1.5K	1%	1/4W	
R308	1-249-415-11	CARBON	680	5%	1/4W	
R309	1-249-419-11	CARBON	1.5K	5%	1/4W	
R310	1-215-427-00	METAL	1.8K	1%	1/4W	
R311	1-215-453-00	METAL	22K	1%	1/4W	
R312	1-249-419-11	CARBON	1.5K	5%	1/4W	
R313	1-249-405-11	CARBON	100	5%	1/4W	
R314	1-215-445-00	METAL	10K	1%	1/4W	
R315	1-215-445-00	METAL	10K	1%	1/4W	
R316	1-249-429-11	CARBON	10K	5%	1/4W	

\<VARIABLE RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION	REMARK
RV1	1-237-505-21	RES, ADJ, CERMET 50K	
RV2	1-237-505-21	RES, ADJ, CERMET 50K	
RV3	1-237-505-21	RES, ADJ, CERMET 50K	

\<SWITCH\>

REF.NO.	PART NO.	DESCRIPTION	REMARK
S1	1-570-857-11	SWITCH, SLIDE	
S2	1-570-851-11	SWITCH, SLIDE	

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*A-1135-360-A BI BOARD, COMPLETE
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*4-353-708-00 HOOK, FINGER

\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-130-481-00	MYLAR	0.0068MF	5%	50V	
C2	1-136-165-00	FILM	0.1MF	5%	50V	
C3	1-123-369-00	ELECT	4.7MF	20%	25V	

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION			REMARK
C4	1-123-369-00	ELECT	4.7MF	20%	25V
C5	1-102-973-00	CERAMIC	100PF	5%	50V
C7	1-126-233-11	ELECT	22MF	20%	25V
C8	1-123-369-00	ELECT	4.7MF	20%	25V
C11	1-124-915-11	ELECT	10MF	20%	16V
C12	1-101-004-00	CERAMIC	0.01MF		50V
C13	1-101-004-00	CERAMIC	0.01MF		50V
C14	1-101-004-00	CERAMIC	0.01MF		50V
C15	1-126-233-11	ELECT	22MF	20%	16V
C16	1-124-915-11	ELECT	10MF	20%	16V
C17	1-101-004-00	CERAMIC	0.01MF		50V
C18	1-101-004-00	CERAMIC	0.01MF		50V
C19	1-101-004-00	CERAMIC	0.01MF		50V
C41	1-124-034-51	ELECT	33MF	20%	16V
C42	1-124-034-51	ELECT	33MF	20%	16V
C43	1-124-034-51	ELECT	33MF	20%	16V
C44	1-124-034-51	ELECT	33MF	20%	16V
C45	1-124-034-51	ELECT	33MF	20%	16V
C46	1-124-034-51	ELECT	33MF	20%	16V
C51	1-101-004-00	CERAMIC	0.01MF		50V
C52	1-101-004-00	CERAMIC	0.01MF		50V
C53	1-101-004-00	CERAMIC	0.01MF		50V
C54	1-101-004-00	CERAMIC	0.01MF		50V
C55	1-101-004-00	CERAMIC	0.01MF		50V
C56	1-101-004-00	CERAMIC	0.01MF		50V
C57	1-101-004-00	CERAMIC	0.01MF		50V
C71	1-124-034-51	ELECT	33MF	20%	16V
C72	1-124-034-51	ELECT	33MF	20%	16V
C73	1-124-034-51	ELECT	33MF	20%	16V
C74	1-124-034-51	ELECT	33MF	20%	16V
C75	1-124-034-51	ELECT	33MF	20%	16V
C76	1-124-034-51	ELECT	33MF	20%	16V
C81	1-101-004-00	CERAMIC	0.01MF		50V
C82	1-101-004-00	CERAMIC	0.01MF		50V
C83	1-101-004-00	CERAMIC	0.01MF		50V
C84	1-101-004-00	CERAMIC	0.01MF		50V
C85	1-101-004-00	CERAMIC	0.01MF		50V
C86	1-101-004-00	CERAMIC	0.01MF		50V
C87	1-101-004-00	CERAMIC	0.01MF		50V
C101	1-101-004-00	CERAMIC	0.01MF		50V
C102	1-124-791-11	ELECT	1MF	20%	50V
C104	1-124-915-11	ELECT	10MF	20%	16V
C105	1-101-004-00	CERAMIC	0.01MF		50V
C106	1-136-161-00	FILM	0.047MF	5%	50V
C107	1-102-937-00	CERAMIC	4PF	0.25PF	50V
C108	1-101-880-00	CERAMIC	47PF	5%	50V
C109	1-136-161-00	FILM	0.047MF	5%	50V
C110	1-136-161-00	FILM	0.047MF	5%	50V
C114	1-102-951-00	CERAMIC	15PF	5%	50V
C115	1-136-153-00	FILM	0.01MF	5%	50V
C116	1-102-973-00	CERAMIC	100PF	5%	50V
C117	1-101-004-00	CERAMIC	0.01MF		50V
C118	1-101-004-00	CERAMIC	0.01MF		50V
C119	1-102-953-00	CERAMIC	18PF	5%	50V
C120	1-102-038-00	CERAMIC	0.001MF		500V
C122	1-102-943-00	CERAMIC	6PF	0.5PF	50V
C201	1-101-004-00	CERAMIC	0.01MF		50V
C202	1-124-791-11	ELECT	1MF	20%	50V
C204	1-124-915-11	ELECT	10MF	20%	16V
C205	1-101-004-00	CERAMIC	0.01MF		50V
C206	1-136-161-00	FILM	0.047MF	5%	50V
C207	1-102-937-00	CERAMIC	4PF	0.25PF	50V
C208	1-101-880-00	CERAMIC	47PF	5%	50V
C209	1-136-161-00	FILM	0.047MF	5%	50V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C210	1-136-161-00	FILM	0.047MF	5%	50V
C214	1-102-951-00	CERAMIC	15PF	5%	50V
C215	1-136-153-00	FILM	0.01MF	5%	50V
C216	1-102-973-00	CERAMIC	100PF	5%	50V
C217	1-101-004-00	CERAMIC	0.01MF		50V
C218	1-101-004-00	CERAMIC	0.01MF		50V
C219	1-102-953-00	CERAMIC	18PF	5%	50V
C220	1-102-038-00	CERAMIC	0.001MF		500V
C222	1-102-943-00	CERAMIC	6PF	0.5PF	50V
C301	1-101-004-00	CERAMIC	0.01MF		50V
C302	1-124-791-11	ELECT	1MF	20%	50V
C304	1-124-915-11	ELECT	10MF	20%	16V
C305	1-101-004-00	CERAMIC	0.01MF		50V
C306	1-136-161-00	FILM	0.047MF	5%	50V
C307	1-102-937-00	CERAMIC	4PF	0.25PF	50V
C308	1-101-880-00	CERAMIC	47PF	5%	50V
C309	1-136-161-00	FILM	0.047MF	5%	50V
C310	1-136-161-00	FILM	0.047MF	5%	50V
C314	1-102-951-00	CERAMIC	15PF	5%	50V
C315	1-136-153-00	FILM	0.01MF	5%	50V
C316	1-102-973-00	CERAMIC	100PF	5%	50V
C317	1-101-004-00	CERAMIC	0.01MF		50V
C318	1-101-004-00	CERAMIC	0.01MF		50V
C319	1-102-953-00	CERAMIC	18PF	5%	50V
C320	1-102-038-00	CERAMIC	0.001MF		500V
C322	1-102-943-00	CERAMIC	6PF	0.5PF	50V

<COMPOSITION CIRCUIT BLOCK>

REF.NO.	PART NO.	DESCRIPTION
CP3	1-231-765-00	COMPOSITION CIRCUIT BLOCK
CP4	1-231-765-00	COMPOSITION CIRCUIT BLOCK
CP5	1-231-765-00	COMPOSITION CIRCUIT BLOCK
CP6	1-231-765-00	COMPOSITION CIRCUIT BLOCK
CP7	1-231-765-00	COMPOSITION CIRCUIT BLOCK
CP101	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP102	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP103	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP104	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP201	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP202	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP203	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP204	1-232-726-11	COMPOSITION CIRCUIT BLOCK
CP301	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP302	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP303	1-233-012-11	COMPOSITION CIRCUIT BLOCK
CP304	1-232-726-11	COMPOSITION CIRCUIT BLOCK

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D4	8-719-911-19	DIODE 1SS119
D5	8-719-911-19	DIODE 1SS119
D6	8-719-110-31	DIODE RD12ESB2
D7	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D101	8-719-911-19	DIODE 1SS119
D102	8-719-016-42	DIODE MC932
D103	8-719-109-74	DIODE RD4.3ESB1
D104	8-719-911-19	DIODE 1SS119
D105	8-719-109-93	DIODE RD6.2ESB2
D201	8-719-911-19	DIODE 1SS119
D202	8-719-016-42	DIODE MC932
D203	8-719-109-74	DIODE RD4.3ESB1

REF.NO.	PART NO.	DESCRIPTION	REMARK
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-109-93	DIODE RD6.2ESB2	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-016-42	DIODE MC932	
D303	8-719-109-74	DIODE RD4.3ESB1	
D304	8-719-911-19	DIODE 1SS119	
D305	8-719-109-93	DIODE RD6.2ESB2	

\<IC\>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC1	8-759-145-58	IC UPC4558C	
IC101	8-729-140-53	IC UPD4053BC	
IC102	8-766-001-49	TRANSISTOR TX-429M	
IC103	8-759-990-82	IC TL082CP	
IC104	8-759-990-82	IC TL082CP	
IC105	8-759-990-82	IC TL082CP	
IC201	8-729-140-53	IC UPD4053BC	
IC202	8-766-001-49	TRANSISTOR TX-429M	
IC203	8-759-990-82	IC TL082CP	
IC204	8-759-990-82	IC TL082CP	
IC205	8-759-990-82	IC TL082CP	
IC301	8-729-140-53	IC UPD4053BC	
IC302	8-766-001-49	TRANSISTOR TX-429M	
IC303	8-759-990-82	IC TL082CP	
IC304	8-759-990-82	IC TL082CP	
IC305	8-759-990-82	IC TL082CP	

\<TRANSISTOR\>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q1	8-729-900-74	TRANSISTOR DTC143TS	
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q11	8-729-201-05	TRANSISTOR 2SC2878-B	
Q12	8-729-201-05	TRANSISTOR 2SC2878-B	
Q13	8-729-201-05	TRANSISTOR 2SC2878-B	
Q14	8-729-201-05	TRANSISTOR 2SC2878-B	
Q15	8-729-900-65	TRANSISTOR DTA144ES	
Q101	8-729-384-48	TRANSISTOR 2SA844-E	
Q102	8-729-384-48	TRANSISTOR 2SA844-E	
Q103	8-729-384-48	TRANSISTOR 2SA844-E	
Q105	8-729-600-19	TRANSISTOR 2SK381-A	
Q106	8-729-384-48	TRANSISTOR 2SA844-E	
Q107	8-729-266-82	TRANSISTOR 2SC2668-0	
Q108	8-729-384-48	TRANSISTOR 2SA844-E	
Q109	8-729-600-19	TRANSISTOR 2SK381-A	
Q110	8-729-600-19	TRANSISTOR 2SK381-A	
Q113	8-729-600-19	TRANSISTOR 2SK381-A	
Q114	8-729-200-17	TRANSISTOR 2SA1091-0	
Q201	8-729-384-48	TRANSISTOR 2SA844-E	
Q202	8-729-384-48	TRANSISTOR 2SA844-E	
Q203	8-729-384-48	TRANSISTOR 2SA844-E	
Q205	8-729-600-19	TRANSISTOR 2SK381-A	
Q206	8-729-384-48	TRANSISTOR 2SA844-E	
Q207	8-729-266-82	TRANSISTOR 2SC2668-0	
Q208	8-729-384-48	TRANSISTOR 2SA844-E	
Q209	8-729-600-19	TRANSISTOR 2SK381-A	
Q210	8-729-600-19	TRANSISTOR 2SK381-A	
Q213	8-729-600-19	TRANSISTOR 2SK381-A	
Q214	8-729-200-17	TRANSISTOR 2SA1091-0	
Q301	8-729-384-48	TRANSISTOR 2SA844-E	
Q302	8-729-384-48	TRANSISTOR 2SA844-E	
Q303	8-729-384-48	TRANSISTOR 2SA844-E	
Q305	8-729-600-19	TRANSISTOR 2SK381-A	
Q306	8-729-384-48	TRANSISTOR 2SA844-E	
Q307	8-729-266-82	TRANSISTOR 2SC2668-0	
Q308	8-729-384-48	TRANSISTOR 2SA844-E	
Q309	8-729-600-19	TRANSISTOR 2SK381-A	
Q310	8-729-600-19	TRANSISTOR 2SK381-A	
Q313	8-729-600-19	TRANSISTOR 2SK381-A	
Q314	8-729-200-17	TRANSISTOR 2SA1091-0	

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-247-903-00	CARBON	1M	5%	1/4W	
R2	1-249-429-11	CARBON	10K	5%	1/4W	
R3	1-215-493-00	METAL	1M	1%	1/4W	
R4	1-215-469-00	METAL	100K	1%	1/4W	
R5	1-249-435-11	CARBON	33K	5%	1/4W	
R8	1-249-441-11	CARBON	100K	5%	1/4W	
R9	1-249-424-11	CARBON	3.9K	5%	1/4W	
R10	1-249-425-11	CARBON	4.7K	5%	1/4W	
R11	1-249-435-11	CARBON	33K	5%	1/4W	
R12	1-249-429-11	CARBON	10K	5%	1/4W	
R13	1-249-425-11	CARBON	4.7K	5%	1/4W	
R14	1-249-435-11	CARBON	33K	5%	1/4W	
R15	1-249-429-11	CARBON	10K	5%	1/4W	
R23	1-249-417-11	CARBON	1K	5%	1/4W	
R24	1-249-417-11	CARBON	1K	5%	1/4W	
R25	1-249-417-11	CARBON	1K	5%	1/4W	
R31	1-249-430-11	CARBON	12K	5%	1/4W	
R32	1-249-436-11	CARBON	39K	5%	1/4W	
R33	1-249-430-11	CARBON	12K	5%	1/4W	
R51	1-249-417-11	CARBON	1K	5%	1/4W	
R52	1-249-417-11	CARBON	1K	5%	1/4W	
R53	1-249-417-11	CARBON	1K	5%	1/4W	
R54	1-249-431-11	CARBON	15K	5%	1/4W	
R55	1-249-437-11	CARBON	47K	5%	1/4W	
R56	1-249-431-11	CARBON	15K	5%	1/4W	
R57	1-249-431-11	CARBON	15K	5%	1/4W	
R58	1-249-439-11	CARBON	68K	5%	1/4W	
R60	1-215-465-00	METAL	68K	1%	1/4W	
R61	1-215-445-00	METAL	10K	1%	1/4W	
R101	1-249-441-11	CARBON	100K	5%	1/4W	
R102	1-249-421-11	CARBON	2.2K	5%	1/4W	
R104	1-215-469-00	METAL	100K	1%	1/4W	
R105	1-215-477-00	METAL	220K	1%	1/4W	
R106	1-215-427-00	METAL	1.8K	1%	1/4W	
R107	1-249-435-11	CARBON	33K	5%	1/4W	
R108	1-249-430-11	CARBON	12K	5%	1/4W	
R109	1-249-417-11	CARBON	1K	5%	1/4W	
R110	1-249-441-11	CARBON	100K	5%	1/4W	
R111	1-249-417-11	CARBON	1K	5%	1/4W	
R112	1-249-417-11	CARBON	1K	5%	1/4W	
R113	1-247-903-00	CARBON	1M	5%	1/4W	
R114	1-249-419-11	CARBON	1.5K	5%	1/4W	
R115	1-249-419-11	CARBON	1.5K	5%	1/4W	
R116	1-249-424-11	CARBON	3.9K	5%	1/4W	
R117	1-249-419-11	CARBON	1.5K	5%	1/4W	
R118	1-215-421-00	METAL	1K	1%	1/4W	
R119	1-249-405-11	CARBON	100	5%	1/4W	
R120	1-249-405-11	CARBON	100	5%	1/4W	
R121	1-249-409-11	CARBON	220	5%	1/4W	
R122	1-215-427-00	METAL	1.8K	1%	1/4W	
R123	1-249-429-11	CARBON	10K	5%	1/4W	
R124	1-249-429-11	CARBON	10K	5%	1/4W	
R125	1-249-422-11	CARBON	2.7K	5%	1/4W	
R127	1-215-453-00	METAL	22K	1%	1/4W	

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION				REMARK
R128	1-215-445-00	METAL	10K	1%	1/4W	
R136	1-215-477-00	METAL	220K	1%	1/4W	
R137	1-249-417-11	CARBON	1K	5%	1/4W	
R138	1-249-441-11	CARBON	100K	5%	1/4W	
R140	1-249-429-11	CARBON	10K	5%	1/4W	
R141	1-215-469-00	METAL	100K	1%	1/4W	
R142	1-215-455-00	METAL	27K	1%	1/4W	
R143	1-215-488-00	METAL	620K	1%	1/4W	
R144	1-249-434-11	CARBON	27K	5%	1/4W	
R146	1-249-417-11	CARBON	1K	5%	1/4W	
R147	1-249-405-11	CARBON	100	5%	1/4W	
R201	1-249-441-11	CARBON	100K	5%	1/4W	
R202	1-249-421-11	CARBON	2.2K	5%	1/4W	
R204	1-215-469-00	METAL	100K	1%	1/4W	
R205	1-215-477-00	METAL	220K	1%	1/4W	
R206	1-215-427-00	METAL	1.8K	1%	1/4W	
R207	1-249-435-11	CARBON	33K	5%	1/4W	
R208	1-249-430-11	CARBON	12K	5%	1/4W	
R209	1-249-417-11	CARBON	1K	5%	1/4W	
R210	1-249-441-11	CARBON	100K	5%	1/4W	
R211	1-249-417-11	CARBON	1K	5%	1/4W	
R212	1-249-417-11	CARBON	1K	5%	1/4W	
R213	1-247-903-00	CARBON	1M	5%	1/4W	
R214	1-249-419-11	CARBON	1.5K	5%	1/4W	
R215	1-249-419-11	CARBON	1.5K	5%	1/4W	
R216	1-249-424-11	CARBON	3.9K	5%	1/4W	
R217	1-249-419-11	CARBON	1.5K	5%	1/4W	
R218	1-215-421-00	METAL	1K	1%	1/4W	
R219	1-249-405-11	CARBON	100	5%	1/4W	
R220	1-249-405-11	CARBON	100	5%	1/4W	
R221	1-249-409-11	CARBON	220	5%	1/4W	
R222	1-215-427-00	METAL	1.8K	1%	1/4W	
R223	1-249-429-11	CARBON	10K	5%	1/4W	
R224	1-249-429-11	CARBON	10K	5%	1/4W	
R225	1-249-422-11	CARBON	2.7K	5%	1/4W	
R227	1-215-453-00	METAL	22K	1%	1/4W	
R228	1-215-445-00	METAL	10K	1%	1/4W	
R236	1-215-477-00	METAL	220K	1%	1/4W	
R237	1-249-417-11	CARBON	1K	5%	1/4W	
R238	1-249-441-11	CARBON	100K	5%	1/4W	
R240	1-249-429-11	CARBON	10K	5%	1/4W	
R241	1-215-469-00	METAL	100K	1%	1/4W	
R242	1-215-455-00	METAL	27K	1%	1/4W	
R243	1-215-488-00	METAL	620K	1%	1/4W	
R244	1-249-434-11	CARBON	27K	5%	1/4W	
R246	1-249-417-11	CARBON	1K	5%	1/4W	
R247	1-249-405-11	CARBON	100	5%	1/4W	
R301	1-249-441-11	CARBON	100K	5%	1/4W	
R302	1-249-421-11	CARBON	2.2K	5%	1/4W	
R304	1-215-469-00	METAL	100K	1%	1/4W	
R305	1-215-477-00	METAL	220K	1%	1/4W	
R306	1-215-427-00	METAL	1.8K	1%	1/4W	
R307	1-249-435-11	CARBON	33K	5%	1/4W	
R308	1-249-430-11	CARBON	12K	5%	1/4W	
R309	1-249-417-11	CARBON	1K	5%	1/4W	
R310	1-249-441-11	CARBON	100K	5%	1/4W	
R311	1-249-417-11	CARBON	1K	5%	1/4W	
R312	1-249-417-11	CARBON	1K	5%	1/4W	
R313	1-247-903-00	CARBON	1M	5%	1/4W	
R314	1-249-419-11	CARBON	1.5K	5%	1/4W	
R315	1-249-419-11	CARBON	1.5K	5%	1/4W	
R316	1-249-424-11	CARBON	3.9K	5%	1/4W	
R317	1-249-419-11	CARBON	1.5K	5%	1/4W	
R318	1-215-421-00	METAL	1K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R319	1-249-405-11	CARBON	100	5%	1/4W	
R320	1-249-405-11	CARBON	100	5%	1/4W	
R321	1-249-409-11	CARBON	220	5%	1/4W	
R322	1-215-427-00	METAL	1.8K	1%	1/4W	
R323	1-249-429-11	CARBON	10K	5%	1/4W	
R324	1-249-429-11	CARBON	10K	5%	1/4W	
R325	1-249-422-11	CARBON	2.7K	5%	1/4W	
R327	1-215-453-00	METAL	22K	1%	1/4W	
R328	1-215-445-00	METAL	10K	1%	1/4W	
R336	1-215-477-00	METAL	220K	1%	1/4W	
R337	1-249-417-11	CARBON	1K	5%	1/4W	
R338	1-249-441-11	CARBON	100K	5%	1/4W	
R340	1-249-429-11	CARBON	10K	5%	1/4W	
R341	1-215-469-00	METAL	100K	1%	1/4W	
R342	1-215-455-00	METAL	27K	1%	1/4W	
R343	1-215-488-00	METAL	620K	1%	1/4W	
R344	1-249-434-11	CARBON	27K	5%	1/4W	
R346	1-249-417-11	CARBON	1K	5%	1/4W	
R347	1-249-405-11	CARBON	100	5%	1/4W	

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*A-1135-361-A BJ BOARD, COMPLETE
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*4-353-708-00 HOOK, FINGER

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				
C1	1-101-361-00	CERAMIC	150PF	5%	50V	
C2	1-101-361-00	CERAMIC	150PF	5%	50V	
C4	1-102-821-00	CERAMIC	360PF	5%	50V	
C5	1-130-473-00	MYLAR	0.0015MF	5%	50V	
C11	1-104-302-11	POLYSTYRENE	0.001MF	5%	50V	
C12	1-102-525-11	CERAMIC	68PF	5%	50V	
C14	1-102-525-11	CERAMIC	68PF	5%	50V	
C15	1-102-525-11	CERAMIC	68PF	5%	50V	
C16	1-102-525-11	CERAMIC	68PF	5%	50V	
C17	1-102-525-11	CERAMIC	68PF	5%	50V	
C18	1-104-302-11	POLYSTYRENE	0.001MF	5%	50V	
C19	1-102-973-00	CERAMIC	100PF	5%	50V	
C20	1-102-525-11	CERAMIC	68PF	5%	50V	
C21	1-101-361-00	CERAMIC	150PF	5%	50V	
C22	1-101-890-00	CERAMIC	75PF	5%	50V	
C23	1-102-965-00	CERAMIC	39PF	5%	50V	
C25	1-102-946-00	CERAMIC	9PF	1PF	50V	
C26	1-102-944-00	CERAMIC	7PF	1PF	50V	
C27	1-101-361-00	CERAMIC	150PF	5%	50V	
C28	1-130-471-00	MYLAR	0.001MF	5%	50V	
C29	1-130-471-00	MYLAR	0.001MF	5%	50V	
C30	1-101-004-00	CERAMIC	0.01MF		50V	
C31	1-101-361-00	CERAMIC	150PF	5%	50V	
C32	1-101-361-00	CERAMIC	150PF	5%	50V	
C33	1-101-361-00	CERAMIC	150PF	5%	50V	
C34	1-101-361-00	CERAMIC	150PF	5%	50V	
C35	1-130-471-00	MYLAR	0.001MF	5%	50V	
C36	1-102-824-00	CERAMIC	470PF	5%	50V	
C37	1-124-791-11	ELECT	1MF	20%	50V	
C38	1-101-004-00	CERAMIC	0.01MF		50V	
C39	1-101-004-00	CERAMIC	0.01MF		50V	
C40	1-102-074-00	CERAMIC	0.001MF	10%	50V	
C61	1-101-888-00	CERAMIC	68PF	5%	50V	
C62	1-101-880-00	CERAMIC	47PF	5%	50V	
C63	1-101-888-00	CERAMIC	68PF	5%	50V	

REF.NO.	PART NO.	DESCRIPTION				REMARK
C64	1-101-880-00	CERAMIC	47PF	5%		50V
C65	1-102-820-00	CERAMIC	330PF	5%		50V
C66	1-101-004-00	CERAMIC	0.01MF			50V
C67	1-101-880-00	CERAMIC	47PF	5%		50V
C100	1-124-910-11	ELECT	47MF	20%		16V
C102	1-124-034-51	ELECT	33MF	20%		16V
C106	1-101-004-00	CERAMIC	0.01MF			50V
C108	1-124-034-51	ELECT	33MF	20%		16V
C109	1-101-004-00	CERAMIC	0.01MF			50V
C110	1-101-004-00	CERAMIC	0.01MF			50V
C111	1-101-004-00	CERAMIC	0.01MF			50V
C112	1-101-004-00	CERAMIC	0.01MF			50V
C113	1-101-004-00	CERAMIC	0.01MF			50V
C114	1-124-915-11	ELECT	10MF	20%		16V
C115	1-101-004-00	CERAMIC	0.01MF			50V
C116	1-101-004-00	CERAMIC	0.01MF			50V
C117	1-101-004-00	CERAMIC	0.01MF			50V
C118	1-124-915-11	ELECT	10MF	20%		16V
C120	1-101-004-00	CERAMIC	0.01MF			50V
C121	1-101-004-00	CERAMIC	0.01MF			50V
C122	1-101-004-00	CERAMIC	0.01MF			50V
C130	1-124-034-51	ELECT	33MF	20%		16V

<COMPOSITION CIRCUIT BLOCK>

CP1	1-232-738-11	COMPOSITION CIRCUIT BLOCK	
CP2	1-232-738-11	COMPOSITION CIRCUIT BLOCK	
CP3	1-232-738-11	COMPOSITION CIRCUIT BLOCK	
CP4	1-232-738-11	COMPOSITION CIRCUIT BLOCK	
CP5	1-232-738-11	COMPOSITION CIRCUIT BLOCK	

<DIODE>

D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D3	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D9	8-719-911-19	DIODE 1SS119
D11	8-719-016-42	DIODE MC932

<IC>

IC1	8-759-345-38	IC HD14538BP
IC2	8-759-040-01	IC MC14001BCP
IC3	8-759-240-40	IC TC4040BP
IC4	8-759-240-40	IC TC4040BP
IC5	8-759-000-35	IC MC14027BCP
IC6	8-759-000-35	IC MC14027BCP
IC7	8-759-000-35	IC MC14027BCP
IC8	8-759-000-35	IC MC14027BCP
IC9	8-759-000-35	IC MC14027BCP
IC10	8-759-345-38	IC HD14538BP
IC11	8-759-345-38	IC HD14538BP
IC12	8-759-345-38	IC HD14538BP
IC13	8-759-040-01	IC MC14001BCP
IC14	8-759-040-01	IC MC14001BCP
IC15	8-759-240-71	IC TC4071BP
IC16	8-759-040-11	IC MC14011BCP
IC17	8-759-040-11	IC MC14011BCP
IC18	8-759-000-32	IC MC14023BCP
IC19	8-759-240-81	IC TC4081BP
IC20	8-759-240-81	IC TC4081BP
IC21	8-759-240-71	IC TC4071BP

REF.NO.	PART NO.	DESCRIPTION				REMARK
IC22	8-759-240-71	IC TC4071BP				
IC23	8-759-040-73	IC MC14073BCP				
IC24	8-759-000-51	IC MC14069UBCP				
IC25	8-759-000-51	IC MC14069UBCP				
IC26	8-759-041-75	IC MC14175BCP				
IC27	8-759-140-53	IC UPD4053BC				
IC28	8-759-000-77	IC MC14520BCP				
IC29	8-759-345-38	IC HD14538BP				

<COIL>

L1	1-408-098-00	INDUCTOR	560UH
L2	1-408-098-00	INDUCTOR	560UH
L3	9-910-999-31	INDUCTOR	680UH

<TRANSISTOR>

Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q19	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q20	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q21	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q23	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q24	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q25	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q26	8-729-119-78	TRANSISTOR 2SC2785-HFE

<RESISTOR>

R2	1-215-439-00	METAL	5.6K	1%	1/4W
R3	1-249-422-11	CARBON	2.7K	5%	1/4W
R4	1-215-449-00	METAL	15K	1%	1/4W
R5	1-249-441-11	CARBON	100K	5%	1/4W
R6	1-249-425-11	CARBON	4.7K	5%	1/4W
R7	1-215-439-00	METAL	5.6K	1%	1/4W
R37	1-249-441-11	CARBON	100K	5%	1/4W
R38	1-215-454-00	METAL	24K	1%	1/4W
R39	1-249-422-11	CARBON	2.7K	5%	1/4W
R42	1-249-433-11	CARBON	22K	5%	1/4W
R43	1-247-876-11	CARBON	75K	5%	1/4W
R44	1-249-429-11	CARBON	10K	5%	1/4W
R45	1-249-441-11	CARBON	100K	5%	1/4W
R46	1-249-441-11	CARBON	100K	5%	1/4W
R47	1-247-862-11	CARBON	20K	5%	1/4W
R48	1-215-467-00	METAL	82K	1%	1/4W
R49	1-249-422-11	CARBON	2.7K	5%	1/4W
R50	1-215-469-00	METAL	100K	1%	1/4W
R51	1-215-445-00	METAL	10K	1%	1/4W
R52	1-247-885-00	CARBON	180K	5%	1/4W
R53	1-215-449-00	METAL	15K	1%	1/4W
R54	1-249-422-11	CARBON	2.7K	5%	1/4W
R56	1-249-434-11	CARBON	27K	5%	1/4W
R57	1-249-422-11	CARBON	2.7K	5%	1/4W
R58	1-249-425-11	CARBON	4.7K	5%	1/4W
R59	1-247-836-11	CARBON	1.6K	5%	1/4W
R60	1-249-427-11	CARBON	6.8K	5%	1/4W
R61	1-215-449-00	METAL	15K	1%	1/4W
R62	1-249-433-11	CARBON	22K	5%	1/4W
R63	1-249-425-11	CARBON	4.7K	5%	1/4W
R64	1-249-425-11	CARBON	4.7K	5%	1/4W

REF.NO.	PART NO.	DESCRIPTION				REMARK
R65	1-249-417-11	CARBON	1K	5%	1/4W	
R66	1-249-430-11	CARBON	12K	5%	1/4W	
R67	1-249-425-11	CARBON	4.7K	5%	1/4W	
R68	1-249-433-11	CARBON	22K	5%	1/4W	
R69	1-249-425-11	CARBON	4.7K	5%	1/4W	
R70	1-249-417-11	CARBON	1K	5%	1/4W	
R71	1-249-430-11	CARBON	12K	5%	1/4W	
R72	1-249-433-11	CARBON	22K	5%	1/4W	
R74	1-249-430-11	CARBON	12K	5%	1/4W	
R75	1-249-422-11	CARBON	2.7K	5%	1/4W	
R76	1-215-463-00	METAL	56K	1%	1/4W	
R77	1-215-475-00	METAL	180K	1%	1/4W	
R78	1-215-439-00	METAL	5.6K	1%	1/4W	
R79	1-249-425-11	CARBON	4.7K	5%	1/4W	
R80	1-249-433-11	CARBON	22K	5%	1/4W	
R81	1-249-425-11	CARBON	4.7K	5%	1/4W	
R82	1-249-415-11	CARBON	680	5%	1/4W	
R83	1-249-417-11	CARBON	1K	5%	1/4W	
R85	1-249-430-11	CARBON	12K	5%	1/4W	
R87	1-249-422-11	CARBON	2.7K	5%	1/4W	
R89	1-247-887-00	CARBON	220K	5%	1/4W	
R90	1-249-441-11	CARBON	100K	5%	1/4W	
R91	1-249-441-11	CARBON	100K	5%	1/4W	
R92	1-249-441-11	CARBON	100K	5%	1/4W	
R93	1-249-429-11	CARBON	10K	5%	1/4W	
R94	1-249-429-11	CARBON	10K	5%	1/4W	
R95	1-249-441-11	CARBON	100K	5%	1/4W	
R96	1-249-417-11	CARBON	1K	5%	1/4W	
R100	1-249-423-11	CARBON	3.3K	5%	1/4W	
R111	1-249-427-11	CARBON	6.8K	5%	1/4W	
R112	1-249-429-11	CARBON	10K	5%	1/4W	
R113	1-249-429-11	CARBON	10K	5%	1/4W	
R114	1-249-422-11	CARBON	2.7K	5%	1/4W	
R115	1-249-419-11	CARBON	1.5K	5%	1/4W	
R116	1-249-427-11	CARBON	6.8K	5%	1/4W	
R117	1-249-429-11	CARBON	10K	5%	1/4W	
R118	1-249-429-11	CARBON	10K	5%	1/4W	
R119	1-249-422-11	CARBON	2.7K	5%	1/4W	
R120	1-249-419-11	CARBON	1.5K	5%	1/4W	
R121	1-249-417-11	CARBON	1K	5%	1/4W	
R122	1-249-417-11	CARBON	1K	5%	1/4W	
R123	1-249-413-11	CARBON	470	5%	1/4W	
R124	1-249-417-11	CARBON	1K	5%	1/4W	
R125	1-249-417-11	CARBON	1K	5%	1/4W	
R126	1-249-417-11	CARBON	1K	5%	1/4W	
R127	1-249-417-11	CARBON	1K	5%	1/4W	
R128	1-249-417-11	CARBON	1K	5%	1/4W	
R129	1-249-417-11	CARBON	1K	5%	1/4W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION
RV1	1-237-504-21	RES, ADJ, CERMET 20K
RV3	1-237-504-21	RES, ADJ, CERMET 20K
RV4	1-237-503-21	RES, ADJ, CERMET 10K
RV5	1-237-506-21	RES, ADJ, CERMET 100K
RV6	1-237-505-21	RES, ADJ, CERMET 50K
RV7	1-237-504-21	RES, ADJ, CERMET 20K
RV8	1-237-504-21	RES, ADJ, CERMET 20K
RV9	1-237-505-21	RES, ADJ, CERMET 50K

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION
S1	1-570-857-11	SWITCH, SLIDE

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        *A-1135-464-A  BK BOARD, COMPLETE
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        *2-365-226-00  HEAT SINK
         4-370-970-01  SPACER, TR
        *4-379-411-01  RETAINER (BK), TR
        *4-902-345-01  HEAT SINK
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<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
BK1	*1-566-056-11	PIN, CONNECTOR 4P	
BK2	*1-566-056-11	PIN, CONNECTOR 4P	
BK3	*1-566-056-11	PIN, CONNECTOR 4P	
BK4	*1-566-055-11	PIN, CONNECTOR 3P	
BK5	*1-566-057-11	PIN, CONNECTOR 5P	
BK6	*1-566-056-11	PIN, CONNECTOR 4P	
BK7	*1-566-056-11	PIN, CONNECTOR 4P	
BK8	*1-566-056-11	PIN, CONNECTOR 4P	

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-130-483-00	MYLAR	0.01MF	5%	50V	
C10	1-124-046-00	ELECT	10MF	20%	160V	
C11	1-130-483-00	MYLAR	0.01MF	5%	50V	
C51	1-101-004-00	CERAMIC	0.01MF		50V	
C52	1-101-004-00	CERAMIC	0.01MF		50V	
C53	1-101-004-00	CERAMIC	0.01MF		50V	
C54	1-101-004-00	CERAMIC	0.01MF		50V	
C55	1-101-004-00	CERAMIC	0.01MF		50V	
C56	1-101-004-00	CERAMIC	0.01MF		50V	
C64	1-124-034-51	ELECT	33MF	20%	16V	
C65	1-124-034-51	ELECT	33MF	20%	16V	
C66	1-124-034-51	ELECT	33MF	20%	16V	
C67	1-124-034-51	ELECT	33MF	20%	16V	
C68	1-124-034-51	ELECT	33MF	20%	16V	
C69	1-124-034-51	ELECT	33MF	20%	16V	
C70	1-124-034-51	ELECT	33MF	20%	16V	
C71	1-124-034-51	ELECT	33MF	20%	16V	
C72	1-124-034-51	ELECT	33MF	20%	16V	
C73	1-124-034-51	ELECT	33MF	20%	16V	
C74	1-124-034-51	ELECT	33MF	20%	16V	
C75	1-124-034-51	ELECT	33MF	20%	16V	
C76	1-124-034-51	ELECT	33MF	20%	16V	
C80	1-124-046-00	ELECT	10MF	20%	160V	
C81	1-124-046-00	ELECT	10MF	20%	160V	
C82	1-124-046-00	ELECT	10MF	20%	160V	
C83	1-123-939-00	ELECT	10MF	20%	200V	
C84	1-123-939-00	ELECT	10MF	20%	200V	
C85	1-123-939-00	ELECT	10MF	20%	200V	
C86	1-123-939-00	ELECT	10MF	20%	200V	
C87	1-123-939-00	ELECT	10MF	20%	200V	
C88	1-123-939-00	ELECT	10MF	20%	200V	
C91	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C92	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C93	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C100	1-136-165-00	FILM	0.1MF	5%	50V	
C102	1-124-046-00	ELECT	10MF	20%	160V	
C103	1-102-976-00	CERAMIC	180PF	5%	50V	
C104	1-136-110-00	FILM	0.91MF	5%	200V	
C105	1-124-034-51	ELECT	33MF	20%	16V	
C106	1-124-910-11	ELECT	47MF	20%	25V	
C107	1-101-004-00	CERAMIC	0.01MF		50V	
C108	1-106-371-00	MYLAR	0.015MF	10%	200V	

REF.NO.	PART NO.	DESCRIPTION				REMARK
C109	1-124-046-00	ELECT	10MF	20%	160V	
C110	1-102-973-00	CERAMIC	100PF	5%	50V	
C111	1-102-965-00	CERAMIC	39PF	5%	50V	
C112	1-102-942-00	CERAMIC	5PF	1PF	50V	
C114	1-102-936-00	CERAMIC	3PF	0.25PF	50V	
C115	1-101-880-00	CERAMIC	47PF	5%	50V	
C133	1-102-942-00	CERAMIC	5PF	1PF	50V	
C200	1-136-165-00	FILM	0.1MF	5%	50V	
C202	1-124-046-00	ELECT	10MF	20%	160V	
C203	1-102-976-00	CERAMIC	180PF	5%	50V	
C204	1-136-110-00	FILM	0.91MF	5%	200V	
C205	1-124-034-51	ELECT	33MF	20%	16V	
C206	1-124-910-11	ELECT	47MF	20%	25V	
C207	1-101-004-00	CERAMIC	0.01MF		50V	
C208	1-106-371-00	MYLAR	0.015MF	10%	200V	
C209	1-124-046-00	ELECT	10MF	20%	160V	
C210	1-102-973-00	CERAMIC	100PF	5%	50V	
C211	1-102-965-00	CERAMIC	39PF	5%	50V	
C212	1-102-942-00	CERAMIC	5PF	1PF	50V	
C214	1-102-936-00	CERAMIC	3PF	0.25PF	50V	
C215	1-101-880-00	CERAMIC	47PF	5%	50V	
C233	1-102-942-00	CERAMIC	5PF	1PF	50V	
C300	1-136-165-00	FILM	0.1MF	5%	50V	
C302	1-124-046-00	ELECT	10MF	20%	160V	
C303	1-102-976-00	CERAMIC	180PF	5%	50V	
C304	1-136-110-00	FILM	0.91MF	5%	200V	
C305	1-124-034-51	ELECT	33MF	20%	16V	
C306	1-124-910-11	ELECT	47MF	20%	25V	
C307	1-101-004-00	CERAMIC	0.01MF		50V	
C308	1-106-371-00	MYLAR	0.015MF	10%	200V	
C309	1-124-046-00	ELECT	10MF	20%	160V	
C310	1-102-973-00	CERAMIC	100PF	5%	50V	
C311	1-102-965-00	CERAMIC	39PF	5%	50V	
C312	1-102-942-00	CERAMIC	5PF	1PF	50V	
C314	1-102-936-00	CERAMIC	3PF	0.25PF	50V	
C315	1-101-880-00	CERAMIC	47PF	5%	50V	
C333	1-102-942-00	CERAMIC	5PF	1PF	50V	

<TRIMMER>

REF.NO.	PART NO.	DESCRIPTION
CV101	1-141-179-12	CAP, VAR, TRIMMER
CV102	1-141-171-00	CAP, TRIMMER 15P
CV201	1-141-179-12	CAP, VAR, TRIMMER
CV202	1-141-171-00	CAP, TRIMMER 15P
CV301	1-141-179-12	CAP, VAR, TRIMMER
CV302	1-141-171-00	CAP, TRIMMER 15P

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D101	8-719-911-19	DIODE 1SS119
D102	8-719-911-19	DIODE 1SS119
D103	8-719-911-19	DIODE 1SS119
D104	8-719-911-19	DIODE 1SS119
D105	8-719-911-19	DIODE 1SS119
D106	8-719-911-19	DIODE 1SS119
D107	8-719-911-19	DIODE 1SS119
D108	8-719-911-19	DIODE 1SS119
D109	8-719-901-83	DIODE 1SS83
D110	8-719-300-80	DIODE RU-1C
D111	8-719-300-80	DIODE RU-1C
D112	8-719-911-19	DIODE 1SS119
D113	8-719-911-19	DIODE 1SS119

REF.NO.	PART NO.	DESCRIPTION	REMARK
D114	8-719-911-19	DIODE 1SS119	
D115	8-719-911-19	DIODE 1SS119	
D116	8-719-911-19	DIODE 1SS119	
D201	8-719-911-19	DIODE 1SS119	
D202	8-719-911-19	DIODE 1SS119	
D203	8-719-911-19	DIODE 1SS119	
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-911-19	DIODE 1SS119	
D206	8-719-911-19	DIODE 1SS119	
D207	8-719-911-19	DIODE 1SS119	
D208	8-719-911-19	DIODE 1SS119	
D209	8-719-901-83	DIODE 1SS83	
D210	8-719-300-80	DIODE RU-1C	
D211	8-719-300-80	DIODE RU-1C	
D212	8-719-911-19	DIODE 1SS119	
D213	8-719-911-19	DIODE 1SS119	
D214	8-719-911-19	DIODE 1SS119	
D215	8-719-911-19	DIODE 1SS119	
D216	8-719-911-19	DIODE 1SS119	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-911-19	DIODE 1SS119	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-911-19	DIODE 1SS119	
D305	8-719-911-19	DIODE 1SS119	
D306	8-719-911-19	DIODE 1SS119	
D307	8-719-911-19	DIODE 1SS119	
D308	8-719-911-19	DIODE 1SS119	
D309	8-719-901-83	DIODE 1SS83	
D310	8-719-300-80	DIODE RU-1C	
D311	8-719-300-80	DIODE RU-1C	
D312	8-719-911-19	DIODE 1SS119	
D313	8-719-911-19	DIODE 1SS119	
D314	8-719-911-19	DIODE 1SS119	
D315	8-719-911-19	DIODE 1SS119	
D316	8-719-911-19	DIODE 1SS119	

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-145-58	IC UPC4558C

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-384-48	TRANSISTOR 2SA844-E
Q12	8-729-200-17	TRANSISTOR 2SA1091-0
Q13	8-729-200-17	TRANSISTOR 2SA1091-0
Q101	8-729-266-82	TRANSISTOR 2SC2668-0
Q102	8-729-384-48	TRANSISTOR 2SA844-E
Q103	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q104	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q105	8-729-384-48	TRANSISTOR 2SA844-E
Q106	8-729-804-63	TRANSISTOR 2SA1406-E
Q107	8-729-804-58	TRANSISTOR 2SC3600-E
Q108	8-729-804-58	TRANSISTOR 2SC3600-E
Q109	8-729-804-63	TRANSISTOR 2SA1406-E
Q110	8-729-804-58	TRANSISTOR 2SC3600-E
Q111	8-729-804-63	TRANSISTOR 2SA1406-E
Q112	8-729-255-12	TRANSISTOR 2SC2551-0
Q113	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q114	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q115	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q201	8-729-266-82	TRANSISTOR 2SC2668-0
Q202	8-729-384-48	TRANSISTOR 2SA844-E
Q203	8-729-119-78	TRANSISTOR 2SC2785-HFE

REF.NO.	PART NO.	DESCRIPTION				REMARK
Q204	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q205	8-729-384-48	TRANSISTOR 2SA844-E				
Q206	8-729-804-63	TRANSISTOR 2SA1406-E				
Q207	8-729-804-58	TRANSISTOR 2SC3600-E				
Q208	8-729-804-58	TRANSISTOR 2SC3600-E				
Q209	8-729-804-63	TRANSISTOR 2SA1406-E				
Q210	8-729-804-58	TRANSISTOR 2SC3600-E				
Q211	8-729-804-63	TRANSISTOR 2SA1406-E				
Q212	8-729-255-12	TRANSISTOR 2SC2551-0				
Q213	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q214	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q215	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q301	8-729-266-82	TRANSISTOR 2SC2668-0				
Q302	8-729-384-48	TRANSISTOR 2SA844-E				
Q303	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q304	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q305	8-729-384-48	TRANSISTOR 2SA844-E				
Q306	8-729-804-63	TRANSISTOR 2SA1406-E				
Q307	8-729-804-58	TRANSISTOR 2SC3600-E				
Q308	8-729-804-58	TRANSISTOR 2SC3600-E				
Q309	8-729-804-63	TRANSISTOR 2SA1406-E				
Q310	8-729-804-58	TRANSISTOR 2SC3600-E				
Q311	8-729-804-63	TRANSISTOR 2SA1406-E				
Q312	8-729-255-12	TRANSISTOR 2SC2551-0				
Q313	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q314	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q315	8-729-119-78	TRANSISTOR 2SC2785-HFE				

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-249-429-11	CARBON	10K	5%	1/4W	
R2	1-249-441-11	CARBON	100K	5%	1/4W	
R3	1-249-417-11	CARBON	1K	5%	1/4W	
R10	1-215-878-00	METAL OXIDE	33K	5%	1W	F
R11	1-249-439-11	CARBON	68K	5%	1/4W	
R12	1-249-417-11	CARBON	1K	5%	1/4W	
R13	1-249-429-11	CARBON	10K	5%	1/4W	
R14	1-215-469-00	METAL	100K	1%	1/4W	
R15	1-215-461-00	METAL	47K	1%	1/4W	
R16	1-215-447-00	METAL	12K	1%	1/4W	
R101	1-215-391-00	METAL	56	1%	1/4W	
R102	1-249-419-11	CARBON	1.5K	5%	1/4W	
R104	1-249-405-11	CARBON	100	5%	1/4W	
R105	1-249-424-11	CARBON	3.9K	5%	1/4W	
R106	1-249-422-11	CARBON	2.7K	5%	1/4W	
R107	1-249-405-11	CARBON	100	5%	1/4W	
R108	1-249-405-11	CARBON	100	5%	1/4W	
R109	1-249-421-11	CARBON	2.2K	5%	1/4W	
R110	1-249-405-11	CARBON	100	5%	1/4W	
R111	1-249-405-11	CARBON	100	5%	1/4W	
R112	1-215-391-00	METAL	56	1%	1/4W	
R113	1-215-391-00	METAL	56	1%	1/4W	
R114	1-215-437-00	METAL	4.7K	1%	1/4W	
R115	1-214-765-00	METAL	33K	1%	1/4W	
R116	1-214-765-00	METAL	33K	1%	1/4W	
R117	1-249-405-11	CARBON	100	5%	1/4W	
R118	1-214-781-00	METAL	150K	1%	1/4W	
R119	1-215-447-00	METAL	12K	1%	1/4W	
R120	1-216-430-11	METAL OXIDE	390	5%	1W	F
R121	1-249-405-11	CARBON	100	5%	1/4W	
R122	1-249-405-11	CARBON	100	5%	1/4W	
R123	1-215-405-00	METAL	220	1%	1/4W	
R124	1-249-405-11	CARBON	100	5%	1/4W	
R125	1-249-405-11	CARBON	100	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R126	1-215-394-00	METAL	75	1%	1/4W	
R127	1-215-394-00	METAL	75	1%	1/4W	
R128	1-214-779-00	METAL	120K	1%	1/4W	
R129	1-249-430-11	CARBON	12K	5%	1/4W	
R130	1-216-443-11	METAL OXIDE	56K	5%	1W	F
R131	1-249-433-11	CARBON	22K	5%	1/4W	
R132	1-249-422-11	CARBON	2.7K	5%	1/4W	
R133	1-249-435-11	CARBON	33K	5%	1/4W	
R134	1-249-433-11	CARBON	22K	5%	1/4W	
R135	1-249-426-11	CARBON	5.6K	5%	1/4W	
R136	1-249-423-11	CARBON	3.3K	5%	1/4W	
R137	1-247-903-00	CARBON	1M	5%	1/4W	
R138	1-249-426-11	CARBON	5.6K	5%	1/4W	
R139	1-215-441-00	METAL	6.8K	1%	1/4W	
R140	1-249-405-11	CARBON	100	5%	1/4W	
R141	1-249-413-11	CARBON	470	5%	1/4W	
R142	1-249-390-11	CARBON	5.6	5%	1/4W	
R143	1-249-422-11	CARBON	2.7K	5%	1/4W	
R201	1-215-391-00	METAL	56	1%	1/4W	
R202	1-249-419-11	CARBON	1.5K	5%	1/4W	
R204	1-249-405-11	CARBON	100	5%	1/4W	
R205	1-249-424-11	CARBON	3.9K	5%	1/4W	
R206	1-249-422-11	CARBON	2.7K	5%	1/4W	
R207	1-249-405-11	CARBON	100	5%	1/4W	
R208	1-249-405-11	CARBON	100	5%	1/4W	
R209	1-249-421-11	CARBON	2.2K	5%	1/4W	
R210	1-249-405-11	CARBON	100	5%	1/4W	
R211	1-249-405-11	CARBON	100	5%	1/4W	
R212	1-215-391-00	METAL	56	1%	1/4W	
R213	1-215-391-00	METAL	56	1%	1/4W	
R214	1-215-437-00	METAL	4.7K	1%	1/4W	
R215	1-214-765-00	METAL	33K	1%	1/4W	
R216	1-214-765-00	METAL	33K	1%	1/4W	
R217	1-249-405-11	CARBON	100	5%	1/4W	
R218	1-214-781-00	METAL	150K	1%	1/4W	
R219	1-215-447-00	METAL	12K	1%	1/4W	
R220	1-216-430-11	METAL OXIDE	390	5%	1W	F
R221	1-249-405-11	CARBON	100	5%	1/4W	
R222	1-249-405-11	CARBON	100	5%	1/4W	
R223	1-215-405-00	METAL	220	1%	1/4W	
R224	1-249-405-11	CARBON	100	5%	1/4W	
R225	1-249-405-11	CARBON	100	5%	1/4W	
R226	1-215-394-00	METAL	75	1%	1/4W	
R227	1-215-394-00	METAL	75	1%	1/4W	
R228	1-214-779-00	METAL	120K	1%	1/4W	
R229	1-249-430-11	CARBON	12K	5%	1/4W	
R230	1-216-443-11	METAL OXIDE	56K	5%	1W	F
R231	1-249-433-11	CARBON	22K	5%	1/4W	
R232	1-249-422-11	CARBON	2.7K	5%	1/4W	
R233	1-249-435-11	CARBON	33K	5%	1/4W	
R234	1-249-433-11	CARBON	22K	5%	1/4W	
R235	1-249-426-11	CARBON	5.6K	5%	1/4W	
R236	1-249-423-11	CARBON	3.3K	5%	1/4W	
R237	1-247-903-00	CARBON	1M	5%	1/4W	
R238	1-249-426-11	CARBON	5.6K	5%	1/4W	
R239	1-215-441-00	METAL	6.8K	1%	1/4W	
R240	1-249-405-11	CARBON	100	5%	1/4W	
R241	1-249-413-11	CARBON	470	5%	1/4W	
R242	1-249-390-11	CARBON	5.6	5%	1/4W	
R243	1-249-422-11	CARBON	2.7K	5%	1/4W	
R301	1-215-391-00	METAL	56	1%	1/4W	
R302	1-249-419-11	CARBON	1.5K	5%	1/4W	
R304	1-249-405-11	CARBON	100	5%	1/4W	

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION				REMARK
R305	1-249-424-11	CARBON	3.9K	5%	1/4W	
R306	1-249-422-11	CARBON	2.7K	5%	1/4W	
R307	1-249-405-11	CARBON	100	5%	1/4W	
R308	1-249-405-11	CARBON	100	5%	1/4W	
R309	1-249-421-11	CARBON	2.2K	5%	1/4W	
R310	1-249-405-11	CARBON	100	5%	1/4W	
R311	1-249-405-11	CARBON	100	5%	1/4W	
R312	1-215-391-00	METAL	56	1%	1/4W	
R313	1-215-391-00	METAL	56	1%	1/4W	
R314	1-215-437-00	METAL	4.7K	1%	1/4W	
R315	1-214-765-00	METAL	33K	1%	1/4W	
R316	1-214-765-00	METAL	33K	1%	1/4W	
R317	1-249-405-11	CARBON	100	5%	1/4W	
R318	1-214-781-00	METAL	150K	1%	1/4W	
R319	1-215-447-00	METAL	12K	1%	1/4W	.
R320	1-216-430-11	METAL OXIDE	390	5%	1W	F
R321	1-249-405-11	CARBON	100	5%	1/4W	
R322	1-249-405-11	CARBON	100	5%	1/4W	
R323	1-215-405-00	METAL	220	1%	1/4W	
R324	1-249-405-11	CARBON	100	5%	1/4W	
R325	1-249-405-11	CARBON	100	5%	1/4W	
R326	1-215-394-00	METAL	75	1%	1/4W	
R327	1-215-394-00	METAL	75	1%	1/4W	
R328	1-214-779-00	METAL	120K	1%	1/4W	
R329	1-249-430-11	CARBON	12K	5%	1/4W	
R330	1-216-443-11	METAL OXIDE	56K	5%	1W	F
R331	1-249-433-11	CARBON	22K	5%	1/4W	
R332	1-249-422-11	CARBON	2.7K	5%	1/4W	
R333	1-249-435-11	CARBON	33K	5%	1/4W	
R334	1-249-433-11	CARBON	22K	5%	1/4W	
R335	1-249-426-11	CARBON	5.6K	5%	1/4W	
R336	1-249-423-11	CARBON	3.3K	5%	1/4W	
R337	1-247-903-00	CARBON	1M	5%	1/4W	
R338	1-249-426-11	CARBON	5.6K	5%	1/4W	
R339	1-215-441-00	METAL	6.8K	1%	1/4W	
R340	1-249-405-11	CARBON	100	5%	1/4W	
R341	1-249-413-11	CARBON	470	5%	1/4W	
R342	1-249-390-11	CARBON	5.6	5%	1/4W	
R343	1-249-422-11	CARBON	2.7K	5%	1/4W	

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   *A-1135-606-B  BT BOARD, COMPLETE (BVM-1911 ONLY)
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   *4-353-708-00  HOOK, FINGER
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<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-124-477-11	ELECT	47MF	20%		16V
C3	1-124-477-11	ELECT	47MF	20%		16V
C4	1-124-477-11	ELECT	47MF	20%		16V
C5	1-163-038-00	CERAMIC CHIP 0.1MF				25V
C6	1-124-477-11	ELECT	47MF	20%		16V
C9	1-163-369-11	CERAMIC CHIP 47PF		5%		50V
C10	1-163-038-00	CERAMIC CHIP 0.1MF				25V
C14	1-163-101-00	CERAMIC CHIP 22PF		5%		50V
C15	1-163-038-00	CERAMIC CHIP 0.1MF				25V
C16	1-163-227-11	CERAMIC CHIP 10PF		0.5PF		50V
C17	1-163-093-00	CERAMIC CHIP 10PF		5%		50V
C18	1-163-038-00	CERAMIC CHIP 0.1MF				25V
C19	1-163-038-00	CERAMIC CHIP 0.1MF				25V
C20	1-163-038-00	CERAMIC CHIP 0.1MF				25V
C21	1-163-038-00	CERAMIC CHIP 0.1MF				25V
C22	1-163-099-00	CERAMIC CHIP 18PF		5%		50V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C23	1-163-097-00	CERAMIC CHIP 15PF		5%	50V
C30	1-163-251-11	CERAMIC CHIP 100PF		5%	50V
C32	1-163-235-11	CERAMIC CHIP 22PF		5%	50V
C34	1-163-099-00	CERAMIC CHIP 18PF		5%	50V
C37	1-163-235-11	CERAMIC CHIP 22PF		5%	50V
C38	1-163-222-11	CERAMIC CHIP 5PF		0.25PF	50V
C40	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C42	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C43	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C44	1-163-113-00	CERAMIC CHIP 68PF		5%	50V
C45	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C47	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C48	1-124-907-11	ELECT	10MF	20%	50V
C49	1-163-097-00	CERAMIC CHIP 15PF		5%	50V
C50	1-124-907-11	ELECT	10MF	20%	50V
C51	1-123-875-11	ELECT	10MF	20%	50V
C52	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C53	1-123-875-11	ELECT	10MF	20%	50V
C54	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C55	1-123-875-11	ELECT	10MF	20%	50V
C56	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C60	1-124-478-11	ELECT	100MF	20%	25V
C61	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C62	1-124-907-11	ELECT	10MF	20%	50V
C63	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C64	1-124-477-11	ELECT	47MF	20%	16V
C65	1-124-907-11	ELECT	10MF	20%	50V
C66	1-124-907-11	ELECT	10MF	20%	50V
C67	1-124-907-11	ELECT	10MF	20%	50V
C68	1-124-907-11	ELECT	10MF	20%	50V
C69	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C70	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C71	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C72	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C73	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C74	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C75	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C76	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C77	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C78	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C79	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C80	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C81	1-123-875-11	ELECT	10MF	20%	50V
C82	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C83	1-123-875-11	ELECT	10MF	20%	50V
C84	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C85	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C86	1-123-875-11	ELECT	10MF	20%	50V
C87	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C88	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C89	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C90	1-124-907-11	ELECT	10MF	20%	50V
C100	1-124-478-11	ELECT	100MF	20%	25V
C101	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C102	1-124-907-11	ELECT	10MF	20%	50V
C103	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C104	1-124-477-11	ELECT	47MF	20%	16V
C105	1-124-907-11	ELECT	10MF	20%	50V
C106	1-124-907-11	ELECT	10MF	20%	50V
C107	1-124-907-11	ELECT	10MF	20%	50V
C108	1-124-907-11	ELECT	10MF	20%	50V
C109	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C110	1-163-038-00	CERAMIC CHIP 0.1MF			25V
C111	1-163-038-00	CERAMIC CHIP 0.1MF			25V

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REMARK		REF.NO.	PART NO.	DESCRIPTION	REMARK
C112	1-163-038-00	CERAMIC CHIP 0.1MF	25V		CV5	1-141-304-21	TRIMMER, CERAMIC	
C113	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C114	1-163-038-00	CERAMIC CHIP 0.1MF	25V		CV6	1-141-304-21	TRIMMER, CERAMIC	
C115	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C116	1-163-038-00	CERAMIC CHIP 0.1MF	25V				**<DIODE>**	
C117	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C118	1-163-038-00	CERAMIC CHIP 0.1MF	25V		D1	8-719-104-34	DIODE 1S2836	
C119	1-163-038-00	CERAMIC CHIP 0.1MF	25V		D2	8-719-105-91	DIODE RD5.6M-B2	
C331	1-135-091-00	TANTAL. CHIP 1MF	20% 16V		D3	8-719-400-18	DIODE MA152WK	
C332	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V		D4	8-719-400-18	DIODE MA152WK	
					D5	8-719-400-18	DIODE MA152WK	
C333	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V					
C334	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V		D6	8-719-104-34	DIODE 1S2836	
C335	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V		D7	8-719-400-18	DIODE MA152WK	
C336	1-163-038-00	CERAMIC CHIP 0.1MF	25V		D8	8-719-104-34	DIODE 1S2836	
C337	1-163-038-00	CERAMIC CHIP 0.1MF	25V		D9	8-719-104-34	DIODE 1S2836	
					D331	8-719-400-18	DIODE MA152WK	
C338	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C339	1-163-038-00	CERAMIC CHIP 0.1MF	25V		D341	8-719-400-18	DIODE MA152WK	
C341	1-135-091-00	TANTAL. CHIP 1MF	20% 16V		D361	8-719-400-18	DIODE MA152WK	
C342	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V					
C343	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V					
							<DELAY LINE>	
C344	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V					
C345	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V		DL1	1-415-348-21	DELAY LINE	
C346	1-163-038-00	CERAMIC CHIP 0.1MF	25V		DL2	1-415-477-11	DELAY LINE	
C347	1-163-038-00	CERAMIC CHIP 0.1MF	25V		DL3	1-415-700-11	DELAY LINE	
C348	1-163-038-00	CERAMIC CHIP 0.1MF	25V		DL4	1-415-654-12	DELAY LINE	
					DL5	1-415-700-11	DELAY LINE	
C349	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C361	1-135-091-00	TANTAL. CHIP 1MF	20% 16V		DL6	1-415-700-11	DELAY LINE	
C362	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V		DL7	1-415-348-21	DELAY LINE	
C363	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V		DL8	1-415-700-11	DELAY LINE	
C364	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V		DL9	1-415-727-11	DELAY LINE	
C365	1-135-092-21	TANTAL. CHIP 3.3MF	20% 16V					
C366	1-163-038-00	CERAMIC CHIP 0.1MF	25V				**<FILTER>**	
C367	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C368	1-163-038-00	CERAMIC CHIP 0.1MF	25V		FL1	1-236-562-11	FILTER, LOW PASS	
C369	1-163-038-00	CERAMIC CHIP 0.1MF	25V		FL2	1-236-561-11	FILTER, LOW PASS	
					FL3	1-236-732-11	FILTER, LOW PASS	
C501	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C502	1-163-038-00	CERAMIC CHIP 0.1MF	25V				**<IC>**	
C503	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C504	1-163-038-00	CERAMIC CHIP 0.1MF	25V		IC1	8-759-800-81	IC LA7016	
C505	1-163-038-00	CERAMIC CHIP 0.1MF	25V		IC2	8-759-800-81	IC LA7016	
					IC3	8-759-520-06	IC XRA17809T	
C506	1-163-038-00	CERAMIC CHIP 0.1MF	25V		IC4	8-759-701-75	IC NJM7805FA	
C507	1-163-038-00	CERAMIC CHIP 0.1MF	25V		IC331	8-752-334-78	IC CXL1009P-1	
C508	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C509	1-163-038-00	CERAMIC CHIP 0.1MF	25V		IC341	8-752-334-78	IC CXL1009P-1	
C510	1-163-038-00	CERAMIC CHIP 0.1MF	25V		IC361	8-752-330-14	IC CXL1009P	
					IC501	8-752-053-68	IC CXA1539P	
C511	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C512	1-163-038-00	CERAMIC CHIP 0.1MF	25V				**<IC SOCKET>**	
C513	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C514	1-163-038-00	CERAMIC CHIP 0.1MF	25V		ICS331*	1-526-656-00	SOCKET, IC (DP) 20P	
C515	1-163-038-00	CERAMIC CHIP 0.1MF	25V		ICS341*	1-526-656-00	SOCKET, IC (DP) 20P	
					ICS361*	1-526-656-00	SOCKET, IC (DP) 20P	
C516	1-163-038-00	CERAMIC CHIP 0.1MF	25V		ICS501*	1-526-659-00	SOCKET, IC (DP) 28P	
C517	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C518	1-163-038-00	CERAMIC CHIP 0.1MF	25V				**<COIL>**	
C519	1-163-038-00	CERAMIC CHIP 0.1MF	25V					
C520	1-163-038-00	CERAMIC CHIP 0.1MF	25V		L1	1-410-196-11	INDUCTOR CHIP 2.2UH	
					L2	1-410-200-31	INDUCTOR CHIP 4.7UH	
C521	1-163-038-00	CERAMIC CHIP 0.1MF	25V		L3	1-410-192-51	INDUCTOR CHIP 1UH	
C522	1-163-038-00	CERAMIC CHIP 0.1MF	25V		L4	1-216-296-00	METAL GLAZE 0 5% 1/8W	
					L5	1-216-296-00	METAL GLAZE 0 5% 1/8W	
		<TRIMMER>						
					L6	1-410-196-11	INDUCTOR CHIP 2.2UH	
CV1	1-141-304-21	TRIMMER, CERAMIC			L7	1-410-470-11	INDUCTOR 10UH	
CV2	1-141-304-21	TRIMMER, CERAMIC			L8	1-410-470-11	INDUCTOR 10UH	
CV3	1-141-304-21	TRIMMER, CERAMIC						
CV4	1-141-304-21	TRIMMER, CERAMIC						

REF.NO.	PART NO.	DESCRIPTION		REMARK
L9	1-410-204-31	INDUCTOR CHIP	10UH	
L10	1-408-419-00	INDUCTOR	68UH	
L11	1-410-200-31	INDUCTOR CHIP	4.7UH	
L12	1-410-200-31	INDUCTOR CHIP	4.7UH	
L13	1-410-196-11	INDUCTOR CHIP	2.2UH	
L14	1-410-204-31	INDUCTOR CHIP	10UH	
L15	1-410-216-31	INDUCTOR CHIP	100UH	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-216-22	TRANSISTOR 2SA1162-G
Q2	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q3	8-729-122-63	TRANSISTOR 2SA1226-E4
Q4	8-729-175-72	TRANSISTOR 2SC2757-T33
Q5	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q6	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q7	8-729-122-63	TRANSISTOR 2SA1226-E4
Q8	8-729-216-22	TRANSISTOR 2SA1162-G
Q9	8-729-122-63	TRANSISTOR 2SA1226-E4
Q10	8-729-175-72	TRANSISTOR 2SC2757-T33
Q11	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q12	8-729-122-63	TRANSISTOR 2SA1226-E4
Q13	8-729-175-72	TRANSISTOR 2SC2757-T33
Q14	8-729-175-72	TRANSISTOR 2SC2757-T33
Q15	8-729-216-22	TRANSISTOR 2SA1162-G
Q16	8-729-107-46	TRANSISTOR 2SC3624A-L15
Q17	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q18	8-729-216-22	TRANSISTOR 2SA1162-G
Q19	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q20	8-729-175-72	TRANSISTOR 2SC2757-T33
Q21	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q22	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q23	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q24	8-729-216-22	TRANSISTOR 2SA1162-G
Q25	8-729-107-46	TRANSISTOR 2SC3624A-L15
Q32	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q33	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q34	8-729-216-22	TRANSISTOR 2SA1162-G
Q35	8-729-216-22	TRANSISTOR 2SA1162-G
Q36	8-729-122-63	TRANSISTOR 2SA1226-E4
Q37	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q38	8-729-122-63	TRANSISTOR 2SA1226-E4
Q39	8-729-175-72	TRANSISTOR 2SC2757-T33
Q40	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q41	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q42	8-729-216-22	TRANSISTOR 2SA1162-G
Q43	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q44	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q45	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q52	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q54	8-729-216-22	TRANSISTOR 2SA1162-G
Q56	8-729-122-63	TRANSISTOR 2SA1226-E4
Q57	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q58	8-729-122-63	TRANSISTOR 2SA1226-E4
Q59	8-729-175-72	TRANSISTOR 2SC2757-T33
Q60	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q61	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q62	8-729-216-22	TRANSISTOR 2SA1162-G
Q65	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q71	8-729-175-72	TRANSISTOR 2SC2757-T33
Q72	8-729-122-63	TRANSISTOR 2SA1226-E4
Q73	8-729-175-72	TRANSISTOR 2SC2757-T33
Q74	8-729-122-63	TRANSISTOR 2SA1226-E4
Q81	8-729-901-06	TRANSISTOR DTA144EK

REF.NO.	PART NO.	DESCRIPTION				REMARK
Q82	8-729-901-01	TRANSISTOR DTC144EK				
Q83	8-729-901-06	TRANSISTOR DTA144EK				
Q84	8-729-901-06	TRANSISTOR DTA144EK				
Q85	8-729-140-97	TRANSISTOR 2SB734-34				
Q86	8-729-140-96	TRANSISTOR 2SD774-34				

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
JW1	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW2	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW3	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW5	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW11	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW12	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW13	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW14	1-216-295-00	METAL GLAZE	0	5%	1/10W	
JW15	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R1	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R2	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R3	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R4	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R5	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R6	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R7	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R8	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R9	1-216-661-11	METAL CHIP	2.7K	0.50%	1/10W	
R10	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R11	1-216-661-11	METAL CHIP	2.7K	0.50%	1/10W	
R12	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R13	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R14	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R15	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R16	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R17	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R18	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R19	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R20	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R21	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R22	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R23	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R24	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R25	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R26	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R27	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R28	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R29	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R30	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R31	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R33	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W	
R34	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R35	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R36	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R37	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R38	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R39	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R40	1-216-630-11	METAL CHIP	130	0.50%	1/10W	
R41	1-216-630-11	METAL CHIP	130	0.50%	1/10W	
R42	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R43	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R44	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R45	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R46	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R47	1-216-025-00	METAL GLAZE	100	5%	1/10W	

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION				REMARK
R48	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R49	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R50	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R51	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R52	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R53	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R54	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R55	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R56	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R57	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R58	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R59	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R60	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R61	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R62	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R63	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R64	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R65	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R66	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R67	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R68	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R69	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R70	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R71	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R72	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R73	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R74	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R75	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R76	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R77	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R78	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R79	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R80	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R81	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R82	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R83	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R84	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R85	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R86	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R87	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R88	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R89	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R103	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R104	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R105	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R106	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R107	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R108	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R109	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R110	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R111	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R112	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R113	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R114	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R115	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R116	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R117	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R118	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R119	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R120	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R121	1-216-657-11	METAL CHIP	1.8K	0.50%	1/10W	
R122	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R123	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R124	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R125	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R126	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R127	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R128	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R129	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R130	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R131	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R132	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R133	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R134	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R135	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R136	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R137	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R138	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R139	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R140	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R141	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R142	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R143	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R150	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R153	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R154	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R157	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R158	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R161	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R163	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R164	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R165	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R166	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R167	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R169	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R170	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R171	1-216-657-11	METAL CHIP	1.8K	0.50%	1/10W	
R172	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R173	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R174	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R175	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R176	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R177	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R178	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R179	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R181	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R182	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R183	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R184	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R185	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R186	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R191	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R192	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R193	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R201	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R202	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R203	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R204	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R205	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R206	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R207	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R208	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R209	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R210	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R211	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R212	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R213	1-216-089-00	METAL GLAZE	47K	5%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R214	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R215	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R216	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R217	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R218	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R219	1-215-881-11	METAL OXIDE	15	5%	2W	F
R331	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R332	1-216-288-11	METAL GLAZE	5.6M	5%	1/8W	
R341	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R342	1-216-288-11	METAL GLAZE	5.6M	5%	1/8W	
R361	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R362	1-216-288-11	METAL GLAZE	5.6M	5%	1/8W	
R501	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R502	1-216-049-00	METAL GLAZE	1K	5%	1/10W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION
RV1	1-237-515-21	RES, ADJ, CERMET 1K
RV2	1-237-517-21	RES, ADJ, CERMET 5K
RV3	1-237-515-21	RES, ADJ, CERMET 1K
RV4	1-237-515-21	RES, ADJ, CERMET 1K
RV5	1-237-515-21	RES, ADJ, CERMET 1K
RV6	1-237-517-21	RES, ADJ, CERMET 5K
RV7	1-237-515-21	RES, ADJ, CERMET 1K
RV8	1-237-515-21	RES, ADJ, CERMET 1K
RV9	1-237-516-21	RES, ADJ, CERMET 2K
RV10	1-237-515-21	RES, ADJ, CERMET 1K
RV11	1-237-516-21	RES, ADJ, CERMET 2K
RV12	1-237-515-21	RES, ADJ, CERMET 1K

<CRYSTAL>

REF.NO.	PART NO.	DESCRIPTION
X1	1-567-790-11	VIBRATOR, CRYSTAL

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*1-617-891-21 PB BOARD
****

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-130-959-00	FILM	0.047MF	10%	400V	
C2	1-130-959-00	FILM	0.047MF	10%	400V	

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION
PB1	*1-508-766-00	PIN, CONNECTOR (5MM PITCH) 4P

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-215-426-00	METAL	1.6K	1%	1/4W
R2	1-215-438-00	METAL	5.1K	1%	1/4W
R3	1-215-426-00	METAL	1.6K	1%	1/4W
R4	1-215-438-00	METAL	5.1K	1%	1/4W
R5	1-215-438-00	METAL	5.1K	1%	1/4W
R6	1-215-438-00	METAL	5.1K	1%	1/4W

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*1-617-895-11 QA BOARD
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<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			
C1	1-108-692-11	MYLAR	0.01MF	10%	200V

REF.NO.	PART NO.	DESCRIPTION				REMARK
C2	1-126-235-11	ELECT	100MF	20%	16V	
C3	1-101-004-00	CERAMIC	0.01MF		50V	
C4	1-108-692-11	MYLAR	0.01MF	10%	200V	
C5	1-126-235-11	ELECT	100MF	20%	16V	
C6	1-101-004-00	CERAMIC	0.01MF		50V	
C7	1-108-692-11	MYLAR	0.01MF	10%	200V	
C8	1-126-235-11	ELECT	100MF	20%	16V	
C9	1-101-004-00	CERAMIC	0.01MF		50V	
C10	1-102-951-00	CERAMIC	15PF	5%	50V	
C11	1-102-951-00	CERAMIC	15PF	5%	50V	
C12	1-102-951-00	CERAMIC	15PF	5%	50V	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-215-449-00	METAL	15K	1%	1/4W
R2	1-215-449-00	METAL	15K	1%	1/4W
R3	1-249-439-11	CARBON	68K	5%	1/4W

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION
S1	1-570-857-11	SWITCH, SLIDE
S2	1-570-857-11	SWITCH, SLIDE
S3	1-570-857-11	SWITCH, SLIDE

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*1-618-786-11 QB BOARD
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<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-108-692-11	MYLAR	0.01MF	10%	200V	
C2	1-126-235-11	ELECT	100MF	20%	16V	
C3	1-101-004-00	CERAMIC	0.01MF		50V	
C4	1-108-692-11	MYLAR	0.01MF	10%	200V	
C5	1-126-235-11	ELECT	100MF	20%	16V	
C6	1-101-004-00	CERAMIC	0.01MF		50V	
C7	1-108-692-11	MYLAR	0.01MF	10%	200V	
C8	1-126-235-11	ELECT	100MF	20%	16V	
C9	1-101-004-00	CERAMIC	0.01MF		50V	
C10	1-102-951-00	CERAMIC	15PF	5%	50V	
C11	1-102-951-00	CERAMIC	15PF	5%	50V	
C12	1-102-951-00	CERAMIC	15PF	5%	50V	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-215-449-00	METAL	15K	1%	1/4W
R2	1-215-449-00	METAL	15K	1%	1/4W
R3	1-215-449-00	METAL	15K	1%	1/4W

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION
S1	1-570-857-11	SWITCH, SLIDE
S2	1-570-857-11	SWITCH, SLIDE
S3	1-570-857-11	SWITCH, SLIDE

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*1-617-885-12 GC BOARD
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<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-126-233-11	ELECT	22MF	20%	25V	
C2	1-126-233-11	ELECT	22MF	20%	25V	
C3	1-126-233-11	ELECT	22MF	20%	25V	

GC | GA

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION				REMARK
C4	1-126-233-11	ELECT	22MF	20%		25V
C5	1-126-233-11	ELECT	22MF	20%		25V
C6	1-126-233-11	ELECT	22MF	20%		25V
C7	1-126-233-11	ELECT	22MF	20%		25V
C8	1-126-233-11	ELECT	22MF	20%		25V
C9	1-126-233-11	ELECT	22MF	20%		25V
C12	1-101-004-00	CERAMIC	0.01MF			50V
C14	1-101-004-00	CERAMIC	0.01MF			50V
C16	1-101-004-00	CERAMIC	0.01MF			50V
C17	1-101-004-00	CERAMIC	0.01MF			50V
C18	1-101-004-00	CERAMIC	0.01MF			50V

\<CONNECTOR\>

REF.NO.	PART NO.	DESCRIPTION
GC1	*1-566-044-11	PIN, CONNECTOR 5P
GC2	*1-566-057-11	PIN, CONNECTOR 5P
GC3	*1-566-044-11	PIN, CONNECTOR 5P

\<IC\>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-929-65	IC LM7912CT
IC2	8-759-929-65	IC LM7912CT
IC3	8-759-701-79	IC NJM7812FA
IC4	8-759-701-79	IC NJM7812FA

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*A-1316-089-A GA BOARD, COMPLETE (BVM-1911 ONLY)
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(INCLUDING GB BOARD)

REF.NO.	PART NO.	DESCRIPTION
⚠	.1-533-167-21	HOLDER, FUSE
⚠	.1-533-168-21	HOLDER, FUSE
	1-535-316-11	TERMINAL, GROUND (M4)
⚠	.1-570-173-22	SWITCH, VOLTAGE CHANGE
⚠	.1-580-375-11	INLET 3P
	2-990-241-02	HOLDER (A), PLUG
	*3-337-402-01	BAND, BINDING
	*4-347-706-00	HEAT SINK (TR)
	*4-371-879-02	COVER, AC SELECT
	4-379-403-01	SPACER (G1), POLISHING
	*4-379-408-01	INSULATOR (G3)
	*4-379-409-01	NUT, PLATE
	4-379-410-01	SPACER (G2), POLISHING
	*4-379-430-01	PANEL, POWER
	*4-386-847-01	HEAT SINK (S.R.T)
	*4-386-848-01	BAND (S.R.T)
	*4-393-031-01	COVER, FUSE HOLDER
	*4-601-466-11	COVER, 3P INLET

\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-124-024-00	ELECT	4.7MF	20%		350V
C2	1-124-024-00	ELECT	4.7MF	20%		350V
C3	1-162-117-00	CERAMIC	100PF	10%		500V
C4	1-162-117-00	CERAMIC	100PF	10%		500V
C5	1-162-117-00	CERAMIC	100PF	10%		500V
C6	1-162-117-00	CERAMIC	100PF	10%		500V
C7	1-126-104-11	ELECT	470MF	20%		25V
C8	1-126-105-11	ELECT	1000MF	20%		25V
C9	1-126-104-11	ELECT	470MF	20%		25V
C10	1-126-105-11	ELECT	1000MF	20%		25V
C11	1-126-104-11	ELECT	470MF	20%		25V
C12	1-124-602-00	ELECT	2200MF	20%		25V
C13	1-126-104-11	ELECT	470MF	20%		25V
C14	1-124-602-00	ELECT	2200MF	20%		25V

REF.NO.	PART NO.	DESCRIPTION				REMARK
C15	1-124-360-00	ELECT	1000MF	20%		16V
C16	1-126-103-11	ELECT	470MF	20%		16V
C17	1-106-375-12	MYLAR	0.022MF	10%		100V
C18	1-108-638-11	MYLAR	0.1MF	10%		100V
C19	1-102-030-00	CERAMIC	330PF	10%		500V
C20	1-162-117-00	CERAMIC	100PF	10%		500V
C21	1-102-038-00	CERAMIC	0.001MF			500V
C22	1-162-117-00	CERAMIC	100PF	10%		500V
C23	1-106-375-12	MYLAR	0.022MF	10%		100V
C24	1-108-638-11	MYLAR	0.1MF	10%		100V
C25	1-124-791-11	ELECT	1MF	20%		50V
C26	1-101-361-00	CERAMIC	150PF	5%		50V
C27	1-101-361-00	CERAMIC	150PF	5%		50V
C28	1-124-915-11	ELECT	10MF	20%		16V
C29	1-124-910-11	ELECT	47MF	20%		25V
C30	1-162-117-00	CERAMIC	100PF	10%		500V
C31	1-102-030-00	CERAMIC	330PF	10%		500V
C32	1-124-791-11	ELECT	1MF	20%		50V
C33	1-101-361-00	CERAMIC	150PF	5%		50V
C34	1-101-361-00	CERAMIC	150PF	5%		50V
C35	1-124-791-11	ELECT	1MF	20%		50V
C36	1-124-910-11	ELECT	47MF	20%		25V
C37	1-130-734-00	FILM	0.0068MF	5%		50V
C38	1-136-165-00	FILM	0.1MF	5%		50V
C39	1-136-165-00	FILM	0.1MF	5%		50V
C40	1-123-381-00	ELECT	2.2MF	20%		50V
C41	1-102-038-00	CERAMIC	0.001MF			500V
C42	1-136-165-00	FILM	0.1MF	5%		50V
C43	1-136-165-00	FILM	0.1MF	5%		50V
C44	1-124-915-11	ELECT	10MF	20%		16V
C45	1-162-132-00	CERAMIC	270PF	10%		2KV
C46	1-124-915-11	ELECT	10MF	20%		16V
C47	1-136-173-00	FILM	0.47MF	5%		50V
C48	1-136-173-00	FILM	0.47MF	5%		50V
C49	1-124-915-11	ELECT	10MF	20%		16V
C50	1-101-006-00	CERAMIC	0.047MF			50V
C51	1-101-006-00	CERAMIC	0.047MF			50V
C52	1-101-006-00	CERAMIC	0.047MF			50V
C53	1-101-006-00	CERAMIC	0.047MF			50V
C54	1-101-006-00	CERAMIC	0.047MF			50V
C55	1-124-915-11	ELECT	10MF	20%		16V
C56	1-136-201-11	FILM	0.22MF	5%		400V
C57	1-124-915-11	ELECT	10MF	20%		25V
C58	1-123-379-00	ELECT	0.47MF	20%		50V
C59	1-130-734-00	FILM	0.0068MF	5%		50V
C60	1-102-228-00	CERAMIC	470PF	10%		500V
C61	1-102-228-00	CERAMIC	470PF	10%		500V
C62	1-102-228-00	CERAMIC	470PF	10%		500V
C63	1-102-228-00	CERAMIC	470PF	10%		500V
C64	1-124-024-00	ELECT	4.7MF	20%		350V
C65	1-124-024-00	ELECT	4.7MF	20%		350V
C66	1-162-117-00	CERAMIC	100PF	10%		500V
C67	1-162-117-00	CERAMIC	100PF	10%		500V
C68	1-162-117-00	CERAMIC	100PF	10%		500V
C69	1-124-562-11	ELECT	47MF	20%		200V
C70	1-124-171-00	ELECT	100MF	20%		160V
C71	1-162-117-00	CERAMIC	100PF	10%		500V
C72	1-124-562-11	ELECT	47MF	20%		200V
C73	1-124-171-00	ELECT	100MF	20%		160V
C74	1-124-122-11	ELECT	100MF	20%		16V
C75	1-124-122-11	ELECT	100MF	20%		16V
C76	⚠ .1-161-953-52	CERAMIC	0.0047MF	20%		400V
C77	⚠ .1-161-953-52	CERAMIC	0.0047MF	20%		400V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C78	1-162-599-12	CERAMIC	0.0047MF	20%	400V
C79	1-162-599-12	CERAMIC	0.0047MF	20%	400V
C80	1-125-658-11	ELECT	560MF	20%	250V
C81	1-125-658-11	ELECT	560MF	20%	250V
C82	1-123-369-00	ELECT	4.7MF	20%	25V
C83	1-101-004-00	CERAMIC	0.01MF		50V
C84 ⚠	.1-136-311-51	FILM	0.47MF	20%	125V
C85 ⚠	.1-162-578-51	CERAMIC	0.0047MF	20%	400V
C86 ⚠	.1-162-578-51	CERAMIC	0.0047MF	20%	400V
C87 ⚠	.1-162-578-51	CERAMIC	0.0047MF	20%	400V
C88 ⚠	.1-162-578-51	CERAMIC	0.0047MF	20%	400V
C89 ⚠	.1-136-311-51	FILM	0.47MF	20%	125V
C90	1-136-171-00	FILM	0.033MF	5%	50V
C92	1-136-171-00	FILM	0.033MF	5%	50V
C94	1-102-038-00	CERAMIC	0.001MF		500V
C95	1-136-173-00	FILM	0.47MF	5%	50V
C96	1-102-050-00	CERAMIC	0.01MF	99%	500V
C97	1-136-173-00	FILM	0.47MF	5%	50V
C98	1-136-173-00	FILM	0.47MF	5%	50V
C99	1-102-050-00	CERAMIC	0.01MF	99%	500V
C100	1-162-117-00	CERAMIC	100PF	10%	500V
C101	1-162-117-00	CERAMIC	100PF	10%	500V
C102	1-136-601-11	FILM	0.01MF	5%	630V
C103	1-136-601-11	FILM	0.01MF	5%	630V

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-912-51	DIODE ESAC25-04C
D2	8-719-918-73	DIODE ESAC25-04N
D3	8-719-901-73	DIODE ESAD25-04D
D4	8-719-901-73	DIODE ESAD25-04D
D5	8-719-907-24	DIODE ESAC31-02D
D6	8-719-907-24	DIODE ESAC31-02D
D7	8-719-300-33	DIODE RU-3AM
D8	8-719-300-52	DIODE CTU-38R
D9	8-719-300-53	DIODE CTU-38S
D10	8-719-912-51	DIODE ESAC25-04C
D11	8-719-918-73	DIODE ESAC25-04N
D12	8-719-911-19	DIODE 1SS119
D13	8-719-911-19	DIODE 1SS119
D14	8-719-100-58	DIODE RD10EB3
D15	8-719-911-19	DIODE 1SS119
D16	8-719-911-19	DIODE 1SS119
D17	8-719-911-19	DIODE 1SS119
D18	8-719-109-89	DIODE RD5.6ESB2
D20	8-719-200-02	DIODE 10E-2
D21 ⚠	8-719-300-07	DIODE RB406N
D22	8-759-157-40	IC UPC574J
D23	8-719-911-19	DIODE 1SS119
D24	8-719-100-58	DIODE RD10EB3
D25	8-719-911-19	DIODE 1SS119
D26	8-719-003-08	THYRISTOR CR3CM-8
D27	8-719-982-04	DIODE ERB81-004
D28	8-719-982-04	DIODE ERB81-004
D29	8-719-982-04	DIODE ERB81-004
D30	8-719-982-04	DIODE ERB81-004
D31	8-719-300-33	DIODE RU-3AM
D32	8-719-300-33	DIODE RU-3AM

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION
GA1	1-506-348-XX	PIN, CONNECTOR 3P
GA2	*1-506-371-00	PIN, CONNECTOR 2P
GA3	*1-508-768-00	PIN, CONNECTOR (5MM PITCH) 6P

REF.NO.	PART NO.	DESCRIPTION			REMARK
GA4	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P			
GA5	*1-566-055-11	PIN, CONNECTOR 3P			
GA6	*1-566-055-11	PIN, CONNECTOR 3P			
GA7	*1-566-058-11	PIN, CONNECTOR 6P			
GA8	*1-566-057-11	PIN, CONNECTOR 5P			

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	1-806-805-11	IC MC5433
IC2	8-759-904-94	IC TL494CN
IC3	8-759-904-94	IC TL494CN

<COIL>

REF.NO.	PART NO.	DESCRIPTION
L3	1-459-643-11	COIL, CHOKE 525UH
L4	1-459-643-11	COIL, CHOKE 525UH
L5	1-459-643-11	COIL, CHOKE 525UH
L6	1-459-643-11	COIL, CHOKE 525UH
L7	1-459-207-00	COIL, CORE
L8	1-459-644-11	COIL, CHOKE 2.9MMH
L9	1-459-645-11	COIL, CHOKE 20MMH
L10	1-421-329-00	COIL, CHOKE
L11	1-421-329-00	COIL, CHOKE
L12	1-421-329-00	COIL, CHOKE
L13	1-421-329-00	COIL, CHOKE
L14	1-421-329-00	COIL, CHOKE
L15	1-421-329-00	COIL, CHOKE
L16	1-421-329-00	COIL, CHOKE
L17 ⚠	.1-421-590-11	TRANSFORMER, LINE FILTER
L18 ⚠	.1-421-590-11	TRANSFORMER, LINE FILTER

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-301-76	TRANSISTOR STR8124-R
Q2	8-729-301-76	TRANSISTOR STR8124-R
Q3	8-729-140-96	TRANSISTOR 2SD774-34
Q4	8-729-140-96	TRANSISTOR 2SD774-34
Q5	8-729-140-96	TRANSISTOR 2SD774-34
Q6	8-729-140-96	TRANSISTOR 2SD774-34
Q7	8-729-140-97	TRANSISTOR 2SB734-34
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q9	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q10	8-729-313-42	TRANSISTOR 2SD1134-C
Q11	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q12	8-729-140-96	TRANSISTOR 2SD774-34
Q13	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION					REMARK
R1	1-215-857-11	METAL OXIDE	10	5%	1W	F	
R2	1-215-857-11	METAL OXIDE	10	5%	1W	F	
R3	1-247-715-11	CARBON	1.5K	5%	1/4W		
R4	1-215-857-11	METAL OXIDE	10	5%	1W	F	
R5	1-215-857-11	METAL OXIDE	10	5%	1W	F	
R6	1-249-447-11	CARBON	1	5%	1/4W	F	
R7	1-247-692-11	CARBON	22	5%	1/4W		
R8	1-249-418-11	CARBON	1.2K	5%	1/4W		
R9	1-249-382-11	CARBON	1.2	5%	1/4W	F	
R10	1-249-447-11	CARBON	1	5%	1/4W	F	
R11	1-247-692-11	CARBON	22	5%	1/4W		
R12	1-249-418-11	CARBON	1.2K	5%	1/4W		
R13	1-215-866-11	METAL OXIDE	330	5%	1W	F	
R14	1-247-700-11	CARBON	100	5%	1/4W		

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7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION				REMARK
R15	1-247-709-11	CARBON	510	5%	1/4W	
R16	1-247-709-11	CARBON	510	5%	1/4W	
R17	1-247-700-11	CARBON	100	5%	1/4W	
R18	1-249-425-11	CARBON	4.7K	5%	1/4W	
R19	1-249-419-11	CARBON	1.5K	5%	1/4W	
R20	1-247-838-00	CARBON	2K	5%	1/4W	
R21	1-249-417-11	CARBON	1K	5%	1/4W	
R22	1-249-409-11	CARBON	220	5%	1/4W	
R23	1-249-417-11	CARBON	1K	5%	1/4W	
R24	1-249-421-11	CARBON	2.2K	5%	1/4W	
R25	1-249-409-11	CARBON	220	5%	1/4W	
R26	1-247-700-11	CARBON	100	5%	1/4W	
R27	1-247-713-11	CARBON	1K	5%	1/4W	
R28	1-247-713-11	CARBON	1K	5%	1/4W	
R29	1-247-700-11	CARBON	100	5%	1/4W	
R30	1-215-886-11	METAL OXIDE	100	5%	2W	F
R31	1-215-886-11	METAL OXIDE	100	5%	2W	F
R32	1-215-886-11	METAL OXIDE	100	5%	2W	F
R33	1-247-697-11	CARBON	56	5%	1/4W	F
R34	1-247-697-11	CARBON	56	5%	1/4W	F
R35	1-215-863-11	METAL OXIDE	100	5%	1W	F
R36	1-249-425-11	CARBON	4.7K	5%	1/4W	
R37	1-249-420-11	CARBON	1.8K	5%	1/4W	
R38	1-249-429-11	CARBON	10K	5%	1/4W	
R39	1-249-413-11	CARBON	470	5%	1/4W	
R40	1-215-453-00	METAL	22K	1%	1/4W	
R41	1-249-425-11	CARBON	4.7K	5%	1/4W	
R42	1-215-437-00	METAL	4.7K	1%	1/4W	
R43	1-215-435-00	METAL	3.9K	1%	1/4W	
R44	1-215-427-00	METAL	1.8K	1%	1/4W	
R45	1-247-713-11	CARBON	1K	5%	1/4W	
R46	1-249-417-11	CARBON	1K	5%	1/4W	
R47	1-216-995-11	METAL	820	1%	10W	
R48	1-215-866-11	METAL OXIDE	330	5%	1W	F
⋈R52 ⚠.		METAL OXIDE			2W	F
⋈R53 ⚠.		METAL			1/4W	
R54	1-215-901-00	METAL OXIDE	33K	5%	2W	F
R55	1-215-426-00	METAL	1.6K	1%	1/4W	
R60	1-249-420-11	CARBON	1.8K	5%	1/4W	
R61	1-249-420-11	CARBON	1.8K	5%	1/4W	
R62	1-249-429-11	CARBON	10K	5%	1/4W	
R64	1-249-426-11	CARBON	5.6K	5%	1/4W	
R65	1-215-437-00	METAL	4.7K	1%	1/4W	
R66	1-215-453-00	METAL	22K	1%	1/4W	
⋈R67 ⚠.		METAL			1/2W	
⋈R68 ⚠.		METAL			1/4W	
R74	1-215-889-00	METAL OXIDE	330	5%	2W	F
R77	1-215-433-00	METAL	3.3K	1%	1/4W	
R78	1-215-433-00	METAL	3.3K	1%	1/4W	
R80 ⚠.	1-202-643-35	SOLID	820K	10%	1/2W	
R81	1-215-461-00	METAL	47K	1%	1/4W	
R82	1-215-461-00	METAL	47K	1%	1/4W	
R83	1-215-461-00	METAL	47K	1%	1/4W	
R84	1-215-459-00	METAL	39K	1%	1/4W	
R85	1-215-449-00	METAL	15K	1%	1/4W	
R86	1-215-437-00	METAL	4.7K	1%	1/4W	
R87	1-249-405-11	CARBON	100	5%	1/4W	
R88	1-249-433-11	CARBON	22K	5%	1/4W	
R89	1-249-429-11	CARBON	10K	5%	1/4W	
R90	1-249-429-11	CARBON	10K	5%	1/4W	
R91	1-249-429-11	CARBON	10K	5%	1/4W	
R92 ⚠.	1-217-295-11	WIREWOUND	5.6	10%	5W	F
R93	1-215-886-11	METAL OXIDE	100	5%	2W	F
R94	1-205-538-00	WIREWOUND	4.7	10%	10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R95	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R96	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R97	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R98	1-215-904-11	METAL OXIDE	100K	5%	2W	F

\<VARIABLE RESISTOR\>

RV1	1-237-514-21	RES, ADJ, CERMET 500
RV2	1-237-515-21	RES, ADJ, CERMET 1K

\<RELAY\>

RY1 ⚠.	1-515-805-11	RELAY, POWER

\<TRANSFORMER\>

T1 ⚠.	1-448-433-11	TRANSFORMER, CONVERTER (S.R.T)
T2 ⚠.	1-447-106-11	TRANSFORMER, DRIVE
T3 ⚠.	1-421-624-12	TRANSFORMER, CURRENT
T4 ⚠.	1-447-426-12	TRANSFORMER, CONVERTER
T5 ⚠.	1-448-432-12	TRANSFORMER, CONVERTER (S.R.T)
T6 ⚠.	1-447-106-11	TRANSFORMER, DRIVE
T7 ⚠.	1-421-624-12	TRANSFORMER, CURRENT

\<THERMISTOR\>

TH1 ⚠.	1-800-820-12	THERMISTOR, POWER
THP1 ⚠.	1-806-387-12	THERMISTOR (POSITIVE)
THP2 ⚠.	1-800-686-33	THERMISTOR (POSITIVE)

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*A-1316-090-A GA BOARD, COMPLETE (BVM-2011P ONLY)
****
(INCLUDING GB BOARD)

⚠.	1-533-167-21	HOLDER, FUSE
⚠.	1-533-168-21	HOLDER, FUSE
	1-535-316-11	TERMINAL, GROUND (M4)
⚠.	1-570-173-22	SWITCH, VOLTAGE CHANGE
⚠.	1-580-375-11	INLET 3P
	2-990-241-02	HOLDER (A), PLUG
*	3-337-402-01	BAND, BINDING
*	4-347-706-00	HEAT SINK (TR)
*	4-371-879-02	COVER, AC SELECT
	4-379-403-01	SPACER (G1), POLISHING
*	4-379-408-01	INSULATOR (G3)
*	4-379-409-01	NUT, PLATE
	4-379-410-01	SPACER (G2), POLISHING
*	4-379-430-01	PANEL, POWER
*	4-386-847-01	HEAT SINK (S.R.T)
*	4-386-848-01	BAND (S.R.T)
*	4-393-031-01	COVER, FUSE HOLDER
*	4-601-466-11	COVER, 3P INLET

\<CAPACITOR\>

C1	1-124-024-00	ELECT	4.7MF	20%	350V
C2	1-124-024-00	ELECT	4.7MF	20%	350V
C3	1-162-117-00	CERAMIC	100PF	10%	500V
C4	1-162-117-00	CERAMIC	100PF	10%	500V
C5	1-162-117-00	CERAMIC	100PF	10%	500V
C6	1-162-117-00	CERAMIC	100PF	10%	500V
C7	1-126-104-11	ELECT	470MF	20%	25V
C8	1-126-105-11	ELECT	1000MF	20%	25V

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REF.NO.	PART NO.	DESCRIPTION				REMARK
C9	1-126-104-11	ELECT	470MF	20%	25V	
C10	1-126-105-11	ELECT	1000MF	20%	25V	
C11	1-126-104-11	ELECT	470MF	20%	25V	
C12	1-124-602-00	ELECT	2200MF	20%	25V	
C13	1-126-104-11	ELECT	470MF	20%	25V	
C14	1-124-602-00	ELECT	2200MF	20%	25V	
C15	1-124-360-00	ELECT	1000MF	20%	16V	
C16	1-126-103-11	ELECT	470MF	20%	16V	
C17	1-106-375-12	MYLAR	0.022MF	10%	100V	
C18	1-108-638-11	MYLAR	0.1MF	10%	100V	
C19	1-102-030-00	CERAMIC	330PF	10%	500V	
C20	1-162-117-00	CERAMIC	100PF	10%	500V	
C21	1-102-038-00	CERAMIC	0.001MF		500V	
C22	1-162-117-00	CERAMIC	100PF	10%	500V	
C23	1-106-375-12	MYLAR	0.022MF	10%	100V	
C24	1-108-638-11	MYLAR	0.1MF	10%	100V	
C25	1-124-903-11	ELECT	1MF	20%	50V	
C26	1-101-361-00	CERAMIC	150PF	5%	50V	
C27	1-101-361-00	CERAMIC	150PF	5%	50V	
C28	1-126-966-11	ELECT	10MF	20%	16V	
C29	1-124-910-11	ELECT	47MF	20%	25V	
C30	1-162-117-00	CERAMIC	100PF	10%	500V	
C31	1-102-030-00	CERAMIC	330PF	10%	500V	
C32	1-124-903-11	ELECT	1MF	20%	50V	
C33	1-101-361-00	CERAMIC	150PF	5%	50V	
C34	1-101-361-00	CERAMIC	150PF	5%	50V	
C35	1-124-903-11	ELECT	1MF	20%	50V	
C36	1-124-910-11	ELECT	47MF	20%	25V	
C37	1-130-734-00	FILM	0.0068MF	5%	50V	
C38	1-136-165-00	FILM	0.1MF	5%	50V	
C39	1-136-165-00	FILM	0.1MF	5%	50V	
C40	1-123-381-00	ELECT	2.2MF	20%	50V	
C41	1-102-038-00	CERAMIC	0.001MF		500V	
C42	1-136-165-00	FILM	0.1MF	5%	50V	
C43	1-136-165-00	FILM	0.1MF	5%	50V	
C44	1-126-966-11	ELECT	10MF	20%	16V	
C45	1-162-132-00	CERAMIC	270PF	10%	2KV	
C46	1-126-966-11	ELECT	10MF	20%	16V	
C47	1-136-173-00	FILM	0.47MF	5%	50V	
C48	1-136-173-00	FILM	0.47MF	5%	50V	
C49	1-126-966-11	ELECT	10MF	20%	16V	
C50	1-101-006-00	CERAMIC	0.047MF		50V	
C51	1-101-006-00	CERAMIC	0.047MF		50V	
C52	1-101-006-00	CERAMIC	0.047MF		50V	
C53	1-101-006-00	CERAMIC	0.047MF		50V	
C54	1-101-006-00	CERAMIC	0.047MF		50V	
C55	1-126-966-11	ELECT	10MF	20%	16V	
C56	1-136-201-11	FILM	0.22MF	5%	400V	
C57	1-124-915-11	ELECT	10MF	20%	25V	
C58	1-124-902-00	ELECT	0.47MF	20%	50V	
C59	1-130-734-00	FILM	0.0068MF	5%	50V	
C60	1-102-228-00	CERAMIC	470PF	10%	500V	
C61	1-102-228-00	CERAMIC	470PF	10%	500V	
C62	1-102-228-00	CERAMIC	470PF	10%	500V	
C63	1-102-228-00	CERAMIC	470PF	10%	500V	
C64	1-124-024-00	ELECT	4.7MF	20%	350V	
C65	1-124-024-00	ELECT	4.7MF	20%	350V	
C66	1-162-117-00	CERAMIC	100PF	10%	500V	
C67	1-162-117-00	CERAMIC	100PF	10%	500V	
C68	1-162-117-00	CERAMIC	100PF	10%	500V	
C69	1-124-562-11	ELECT	47MF	20%	200V	
C70	1-124-171-00	ELECT	100MF	20%	160V	
C71	1-162-117-00	CERAMIC	100PF	10%	500V	
C72	1-124-562-11	ELECT	47MF	20%	200V	

REF.NO.	PART NO.	DESCRIPTION				REMARK
C73	1-124-171-00	ELECT	100MF	20%	160V	
C74	1-124-122-11	ELECT	100MF	20%	16V	
C75	1-124-122-11	ELECT	100MF	20%	16V	
C76 ⚠	1-161-953-52	CERAMIC	0.0047MF	20%	400V	
C77 ⚠	1-161-953-52	CERAMIC	0.0047MF	20%	400V	
C78	1-162-599-12	CERAMIC	0.0047MF	20%	400V	
C79	1-162-599-12	CERAMIC	0.0047MF	20%	400V	
C80	1-125-658-11	ELECT	560MF	20%	250V	
C81	1-125-658-11	ELECT	560MF	20%	250V	
C82	1-123-369-00	ELECT	4.7MF	20%	25V	
C83	1-101-004-00	CERAMIC	0.01MF		50V	
C84 ⚠	1-136-311-61	FILM	0.47MF	20%	300V	
C85 ⚠	1-162-578-51	CERAMIC	0.0047MF	20%	400V	
C86 ⚠	1-162-578-51	CERAMIC	0.0047MF	20%	400V	
C87 ⚠	1-162-578-51	CERAMIC	0.0047MF	20%	400V	
C88 ⚠	1-162-578-51	CERAMIC	0.0047MF	20%	400V	
C89 ⚠	1-136-311-61	FILM	0.47MF	20%	300V	
C90	1-136-171-00	FILM	0.033MF	5%	50V	
C91	1-162-599-12	CERAMIC	0.0047MF	20%	400V	
C92	1-136-171-00	FILM	0.033MF	5%	50V	
C93	1-162-599-12	CERAMIC	0.0047MF	20%	400V	
C94	1-102-038-00	CERAMIC	0.001MF		500V	
C95	1-136-173-00	FILM	0.47MF	5%	50V	
C96	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C97	1-136-173-00	FILM	0.47MF	5%	50V	
C98	1-136-173-00	FILM	0.47MF	5%	50V	
C99	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C100	1-162-117-00	CERAMIC	100PF	10%	500V	
C101	1-162-117-00	CERAMIC	100PF	10%	500V	
C102	1-136-601-11	FILM	0.01MF	5%	630V	
C103	1-136-601-11	FILM	0.01MF	5%	630V	

\<DIODE\>

REF.NO.	PART NO.	DESCRIPTION	
D1	8-719-912-51	DIODE	ESAC25-04C
D2	8-719-918-73	DIODE	ESAC25-04N
D3	8-719-901-73	DIODE	ESAD25-04D
D4	8-719-901-73	DIODE	ESAD25-04D
D5	8-719-907-24	DIODE	ESAC31-02D
D6	8-719-907-24	DIODE	ESAC31-02D
D7	8-719-300-33	DIODE	RU-3AM
D8	8-719-300-52	DIODE	CTU-38R
D9	8-719-300-53	DIODE	CTU-38S
D10	8-719-912-51	DIODE	ESAC25-04C
D11	8-719-918-73	DIODE	ESAC25-04N
D12	8-719-911-19	DIODE	1SS119
D13	8-719-911-19	DIODE	1SS119
D14	8-719-100-58	DIODE	RD10EB3
D15	8-719-911-19	DIODE	1SS119
D16	8-719-911-19	DIODE	1SS119
D17	8-719-911-19	DIODE	1SS119
D18	8-719-109-89	DIODE	RD5.6ESB2
D20	8-719-200-02	DIODE	10E-2
D21 ⚠	8-719-300-07	DIODE	RB406N
D22	8-759-157-40	IC	UPC574J
D23	8-719-911-19	DIODE	1SS119
D24	8-719-100-58	DIODE	RD10EB3
D25	8-719-911-19	DIODE	1SS119
D26	8-719-003-08	THYRISTOR	CR3CM-8
D27	8-719-982-04	DIODE	ERB81-004
D28	8-719-982-04	DIODE	ERB81-004
D29	8-719-982-04	DIODE	ERB81-004
D30	8-719-982-04	DIODE	ERB81-004
D31	8-719-300-33	DIODE	RU-3AM

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The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION				REMARK
D32	8-719-300-33	DIODE RU-3AM				
		<CONNECTOR>				
GA1	1-506-348-XX	PIN, CONNECTOR 3P				
GA2	*1-506-371-00	PIN, CONNECTOR 2P				
GA3	*1-508-768-00	PIN, CONNECTOR (5MM PITCH) 6P				
GA4	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P				
GA5	*1-566-055-11	PIN, CONNECTOR 3P				
GA6	*1-566-055-11	PIN, CONNECTOR 3P				
GA7	*1-566-058-11	PIN, CONNECTOR 6P				
GA8	*1-566-057-11	PIN, CONNECTOR 5P				
		<IC>				
IC1	1-806-805-11	IC MC5433				
IC2	8-759-904-94	IC TL494CN				
IC3	8-759-904-94	IC TL494CN				
		<COIL>				
L3	1-459-643-11	COIL, CHOKE 525UH				
L4	1-459-643-11	COIL, CHOKE 525UH				
L5	1-459-643-11	COIL, CHOKE 525UH				
L6	1-459-643-11	COIL, CHOKE 525UH				
L7	1-459-207-00	COIL, CORE				
L8	1-459-644-11	COIL, CHOKE 2.9MMH				
L9	1-459-645-11	COIL, CHOKE 20MMH				
L10	1-421-329-00	COIL, CHOKE				
L11	1-421-329-00	COIL, CHOKE				
L12	1-421-329-00	COIL, CHOKE				
L13	1-421-329-00	COIL, CHOKE				
L14	1-421-329-00	COIL, CHOKE				
L15	1-421-329-00	COIL, CHOKE				
L16	1-421-329-00	COIL, CHOKE				
L17 ⚠.	1-421-590-11	TRANSFORMER, LINE FILTER				
L18 ⚠.	1-421-590-11	TRANSFORMER, LINE FILTER				
		<TRANSISTOR>				
Q1	8-729-301-76	TRANSISTOR STR8124-R				
Q2	8-729-301-76	TRANSISTOR STR8124-R				
Q3	8-729-140-96	TRANSISTOR 2SD774-34				
Q4	8-729-140-96	TRANSISTOR 2SD774-34				
Q5	8-729-140-96	TRANSISTOR 2SD774-34				
Q6	8-729-140-96	TRANSISTOR 2SD774-34				
Q7	8-729-140-97	TRANSISTOR 2SB734-34				
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q9	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q10	8-729-313-42	TRANSISTOR 2SD1134-C				
Q11	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q12	8-729-140-96	TRANSISTOR 2SD774-34				
Q13	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE				
		<RESISTOR>				
R1	1-215-857-11	METAL OXIDE	10	5%	1W	F
R2	1-215-857-11	METAL OXIDE	10	5%	1W	F
R3	1-247-715-11	CARBON	1.5K	5%	1/4W	
R4	1-215-857-11	METAL OXIDE	10	5%	1W	F
R5	1-215-857-11	METAL OXIDE	10	5%	1W	F
R6	1-249-447-11	CARBON	1	5%	1/4W	F
R7	1-247-692-11	CARBON	22	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R8	1-249-418-11	CARBON	1.2K	5%	1/4W	
R9	1-249-382-11	CARBON	1.2	5%	1/4W	F
R10	1-249-447-11	CARBON	1	5%	1/4W	F
R11	1-247-692-11	CARBON	22	5%	1/4W	
R12	1-249-418-11	CARBON	1.2K	5%	1/4W	
R13	1-215-866-11	METAL OXIDE	330	5%	1W	F
R14	1-247-700-11	CARBON	100	5%	1/4W	
R15	1-247-709-11	CARBON	510	5%	1/4W	
R16	1-247-709-11	CARBON	510	5%	1/4W	
R17	1-247-700-11	CARBON	100	5%	1/4W	
R18	1-249-425-11	CARBON	4.7K	5%	1/4W	
R19	1-249-419-11	CARBON	1.5K	5%	1/4W	
R20	1-247-838-00	CARBON	2K	5%	1/4W	
R21	1-249-417-11	CARBON	1K	5%	1/4W	
R22	1-249-409-11	CARBON	220	5%	1/4W	
R23	1-249-417-11	CARBON	1K	5%	1/4W	
R24	1-249-421-11	CARBON	2.2K	5%	1/4W	
R25	1-249-409-11	CARBON	220	5%	1/4W	
R26	1-247-700-11	CARBON	100	5%	1/4W	
R27	1-247-713-11	CARBON	1K	5%	1/4W	
R28	1-247-713-11	CARBON	1K	5%	1/4W	
R29	1-247-700-11	CARBON	100	5%	1/4W	
R30	1-215-886-11	METAL OXIDE	100	5%	2W	F
R31	1-215-886-11	METAL OXIDE	100	5%	2W	F
R32	1-215-886-11	METAL OXIDE	100	5%	2W	F
R33	1-247-697-11	CARBON	56	5%	1/4W	F
R34	1-247-697-11	CARBON	56	5%	1/4W	F
R35	1-215-863-11	METAL OXIDE	100	5%	1W	F
R36	1-249-425-11	CARBON	4.7K	5%	1/4W	
R37	1-249-420-11	CARBON	1.8K	5%	1/4W	
R38	1-249-429-11	CARBON	10K	5%	1/4W	
R39	1-249-413-11	CARBON	470	5%	1/4W	
R40	1-215-453-00	METAL	22K	1%	1/4W	
R41	1-249-425-11	CARBON	4.7K	5%	1/4W	
R42	1-215-437-00	METAL	4.7K	1%	1/4W	
R43	1-215-435-00	METAL	3.9K	1%	1/4W	
R44	1-215-427-00	METAL	1.8K	1%	1/4W	
R45	1-247-713-11	CARBON	1K	5%	1/4W	
R46	1-249-417-11	CARBON	1K	5%	1/4W	
R47	1-216-995-11	METAL	820	1%	10W	
R48	1-215-866-11	METAL OXIDE	330	5%	1W	F
⋈R52 ⚠.		METAL OXIDE			2W	F
⋈R53 ⚠.		METAL			1/4W	
R54	1-215-901-00	METAL OXIDE	33K	5%	2W	F
R55	1-215-426-00	METAL	1.6K	1%	1/4W	
R60	1-249-420-11	CARBON	1.8K	5%	1/4W	
R61	1-249-420-11	CARBON	1.8K	5%	1/4W	
R62	1-249-429-11	CARBON	10K	5%	1/4W	
R64	1-249-426-11	CARBON	5.6K	5%	1/4W	
R65	1-215-437-00	METAL	4.7K	1%	1/4W	
R66	1-215-453-00	METAL	22K	1%	1/4W	
⋈R67 ⚠.		METAL			1/2W	
⋈R68 ⚠.		METAL			1/4W	
R74	1-215-889-00	METAL OXIDE	330	5%	2W	F
R77	1-215-433-00	METAL	3.3K	1%	1/4W	
R78	1-215-433-00	METAL	3.3K	1%	1/4W	
R80 ⚠.	1-202-643-35	SOLID	820K	10%	1/2W	
R81	1-215-461-00	METAL	47K	1%	1/4W	
R82	1-215-461-00	METAL	47K	1%	1/4W	
R83	1-215-461-00	METAL	47K	1%	1/4W	
R84	1-215-459-00	METAL	39K	1%	1/4W	
R85	1-215-449-00	METAL	15K	1%	1/4W	
R86	1-215-437-00	METAL	4.7K	1%	1/4W	

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION				REMARK
R87	1-249-405-11	CARBON	100	5%	1/4W	
R88	1-249-433-11	CARBON	22K	5%	1/4W	
R89	1-249-429-11	CARBON	10K	5%	1/4W	
R90	1-249-429-11	CARBON	10K	5%	1/4W	
R91	1-249-429-11	CARBON	10K	5%	1/4W	
R92 ⚠	1-217-295-11	WIREWOUND	5.6	10%	5W	F
R93	1-215-886-11	METAL OXIDE	100	5%	2W	F
R94	1-205-538-00	WIREWOUND	4.7	10%	10W	
R95	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R96	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R97	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R98	1-215-904-11	METAL OXIDE	100K	5%	2W	F

\<VARIABLE RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION
RV1	1-237-514-21	RES, ADJ, CERMET 500
RV2	1-237-515-21	RES, ADJ, CERMET 1K

\<RELAY\>

REF.NO.	PART NO.	DESCRIPTION
RY1 ⚠	1-515-805-11	RELAY, POWER

\<TRANSFORMER\>

REF.NO.	PART NO.	DESCRIPTION
T1 ⚠	1-448-433-11	TRANSFORMER, CONVERTER (S.R.T)
T2 ⚠	1-447-106-11	TRANSFORMER, DRIVE
T3 ⚠	1-421-624-12	TRANSFORMER, CURRENT
T4 ⚠	1-447-426-12	TRANSFORMER, CONVERTER
T5 ⚠	1-448-432-12	TRANSFORMER, CONVERTER (S.R.T)
T6 ⚠	1-447-106-11	TRANSFORMER, DRIVE
T7 ⚠	1-421-624-12	TRANSFORMER, CURRENT

\<THERMISTOR\>

REF.NO.	PART NO.	DESCRIPTION
TH1 ⚠	1-800-820-12	THERMISTOR, POWER
THP1 ⚠	1-806-387-12	THERMISTOR (POSITIVE)
THP2 ⚠	1-800-686-33	THERMISTOR (POSITIVE)

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*1-627-679-11   GB BOARD
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\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION			
C1	1-124-791-11	ELECT	1MF	20%	50V
C2	1-124-791-11	ELECT	1MF	20%	50V

\<DIODE\>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-911-19	DIODE 1SS119
D2	8-719-110-08	DIODE RD8.2ESB2
D3	8-719-911-19	DIODE 1SS119
D4	8-719-911-19	DIODE 1SS119
D5	8-719-911-19	DIODE 1SS119
D6	8-719-110-08	DIODE RD8.2ESB2
D7	8-719-812-41	DIODE TLR124
D8	8-719-911-19	DIODE 1SS119
D9	8-719-911-19	DIODE 1SS119
D10	8-719-812-41	DIODE TLR124
D11	8-719-110-08	DIODE RD8.2ESB2
D12	8-719-911-19	DIODE 1SS119
D13	8-719-911-19	DIODE 1SS119
D14	8-719-911-19	DIODE 1SS119
D15	8-719-911-19	DIODE 1SS119

REF.NO.	PART NO.	DESCRIPTION	REMARK
D16	8-719-911-19	DIODE 1SS119	
D17	8-719-110-08	DIODE RD8.2ESB2	
D18	8-719-911-19	DIODE 1SS119	
D19	8-719-911-19	DIODE 1SS119	

\<CONNECTOR\>

REF.NO.	PART NO.	DESCRIPTION
GA1	*1-506-603-11	PLUG, L TYPE (2.0MM PITCH) 10P

\<TRANSISTOR\>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q3	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q5	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q6	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q7	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q9	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-249-427-11	CARBON	6.8K	5%	1/4W
R2	1-249-428-11	CARBON	8.2K	5%	1/4W
R3	1-249-429-11	CARBON	10K	5%	1/4W
R4	1-249-427-11	CARBON	6.8K	5%	1/4W
R5	1-249-420-11	CARBON	1.8K	5%	1/4W
R6	1-249-427-11	CARBON	6.8K	5%	1/4W
R7	1-249-420-11	CARBON	1.8K	5%	1/4W
R8	1-249-429-11	CARBON	10K	5%	1/4W
R9	1-249-427-11	CARBON	6.8K	5%	1/4W
R10	1-249-428-11	CARBON	8.2K	5%	1/4W
R11	1-249-424-11	CARBON	3.9K	5%	1/4W
R12	1-249-421-11	CARBON	2.2K	5%	1/4W
R13	1-249-425-11	CARBON	4.7K	5%	1/4W
R14	1-249-421-11	CARBON	2.2K	5%	1/4W
R15	1-249-424-11	CARBON	3.9K	5%	1/4W
R16	1-249-421-11	CARBON	2.2K	5%	1/4W
R17	1-249-425-11	CARBON	4.7K	5%	1/4W
R18	1-249-421-11	CARBON	2.2K	5%	1/4W
R19	1-249-429-11	CARBON	10K	5%	1/4W
R20	1-249-429-11	CARBON	10K	5%	1/4W
R21	1-249-429-11	CARBON	10K	5%	1/4W
R22	1-249-423-11	CARBON	3.3K	5%	1/4W
R23	1-249-423-11	CARBON	3.3K	5%	1/4W
R24	1-249-429-11	CARBON	10K	5%	1/4W
R25	1-249-429-11	CARBON	10K	5%	1/4W

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*1-617-889-11   C BOARD
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⚠ 1-526-771-11   SOCKET, CRT
1-556-880-81   LEAD ASSY, HIGH-VOLTAGE

\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION		REMARK
C1	1-162-114-00	CERAMIC	0.0047MF	2KV
C2	1-162-114-00	CERAMIC	0.0047MF	2KV

\<CONNECTOR\>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C1	*1-566-054-11	PIN, CONNECTOR 2P			
C2	*1-566-056-11	PIN, CONNECTOR 4P			
C3	*1-566-054-11	PIN, CONNECTOR 2P			
C4	*1-566-056-11	PIN, CONNECTOR 4P			
C5	*1-566-054-11	PIN, CONNECTOR 2P			
C6	*1-566-056-11	PIN, CONNECTOR 4P			
C7	*1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P			
C8	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P			

<COIL>

REF.NO.	PART NO.	DESCRIPTION		
L1	1-408-408-00	INDUCTOR	8.2UH	
L2	1-408-408-00	INDUCTOR	8.2UH	
L3	1-408-408-00	INDUCTOR	8.2UH	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-202-818-00	SOLID	1K	10%	1/2W
R2	1-202-818-00	SOLID	1K	10%	1/2W
R3	1-202-818-00	SOLID	1K	10%	1/2W
R4	1-249-431-11	CARBON	15K	5%	1/4W
R5	1-202-818-00	SOLID	1K	10%	1/2W
R6	1-202-818-00	SOLID	1K	10%	1/2W
R7	1-202-818-00	SOLID	1K	10%	1/2W
R8	1-249-431-11	CARBON	15K	5%	1/4W
R9	1-202-818-00	SOLID	1K	10%	1/2W
R10	1-202-818-00	SOLID	1K	10%	1/2W
R11	1-202-818-00	SOLID	1K	10%	1/2W
R12	1-249-431-11	CARBON	15K	5%	1/4W
R13	1-202-818-00	SOLID	1K	10%	1/2W

<SPARK GAP>

REF.NO.	PART NO.	DESCRIPTION
SG1	1-519-063-XX	DISCHARGING GAP
SG2	1-519-063-XX	DISCHARGING GAP
SG3	1-519-063-XX	DISCHARGING GAP
SG4	1-519-063-XX	DISCHARGING GAP
SG5	1-519-063-XX	DISCHARGING GAP
SG6	1-519-063-XX	DISCHARGING GAP
SG7	1-519-063-XX	DISCHARGING GAP

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*A-1341-408-A DC BOARD, COMPLETE
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<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				
C1	1-126-157-11	ELECT	10MF	20%	16V	
C2	1-126-157-11	ELECT	10MF	20%	16V	
C3	1-163-038-00	CERAMIC CHIP 0.1MF			25V	
C4	1-163-038-00	CERAMIC CHIP 0.1MF			25V	
C5	1-163-038-00	CERAMIC CHIP 0.1MF			25V	
C6	1-163-038-00	CERAMIC CHIP 0.1MF			25V	

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION
DC1	*1-566-062-11	PIN, CONNECTOR 10P
DC2	*1-566-062-11	PIN, CONNECTOR 10P

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-509-17	IC XRU4053BF
IC2	8-759-509-17	IC XRU4053BF
IC3	8-759-509-17	IC XRU4053BF

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION			
Q1	8-729-901-01	TRANSISTOR DTC144EK			
Q2	8-729-901-01	TRANSISTOR DTC144EK			
Q3	8-729-901-01	TRANSISTOR DTC144EK			
Q4	8-729-901-01	TRANSISTOR DTC144EK			

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R2	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R3	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R4	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R5	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R6	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R7	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R8	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R9	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R10	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R11	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R12	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R13	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R14	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R15	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R16	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R17	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R18	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R19	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R20	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R21	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R22	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R23	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R24	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R25	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R26	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R27	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R28	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R29	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R30	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R31	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R32	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R37	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R39	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R40	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R41	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R42	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R51	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R52	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R53	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R54	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R55	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R56	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R57	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R58	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R59	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R60	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R61	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R62	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R63	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R64	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R65	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R66	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R67	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R68	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R69	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R70	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R71	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	
RV1	1-228-459-00	RES, ADJ, CERMET	10K
RV2	1-228-459-00	RES, ADJ, CERMET	10K
RV3	1-228-459-00	RES, ADJ, CERMET	10K
RV4	1-228-459-00	RES, ADJ, CERMET	10K
RV5	1-228-459-00	RES, ADJ, CERMET	10K
RV6	1-228-459-00	RES, ADJ, CERMET	10K
RV7	1-228-459-00	RES, ADJ, CERMET	10K
RV8	1-228-459-00	RES, ADJ, CERMET	10K
RV9	1-228-459-00	RES, ADJ, CERMET	10K
RV10	1-228-459-00	RES, ADJ, CERMET	10K
RV11	1-228-459-00	RES, ADJ, CERMET	10K
RV12	1-228-459-00	RES, ADJ, CERMET	10K
RV13	1-228-459-00	RES, ADJ, CERMET	10K
RV14	1-228-459-00	RES, ADJ, CERMET	10K
RV15	1-228-459-00	RES, ADJ, CERMET	10K
RV16	1-228-459-00	RES, ADJ, CERMET	10K
RV17	1-228-459-00	RES, ADJ, CERMET	10K
RV18	1-228-459-00	RES, ADJ, CERMET	10K
RV19	1-228-459-00	RES, ADJ, CERMET	10K
RV20	1-228-459-00	RES, ADJ, CERMET	10K
RV21	1-228-459-00	RES, ADJ, CERMET	10K
RV22	1-228-459-00	RES, ADJ, CERMET	10K
RV23	1-228-459-00	RES, ADJ, CERMET	10K
RV24	1-228-459-00	RES, ADJ, CERMET	10K
RV25	1-228-459-00	RES, ADJ, CERMET	10K
RV26	1-228-459-00	RES, ADJ, CERMET	10K
RV27	1-228-459-00	RES, ADJ, CERMET	10K
RV28	1-228-459-00	RES, ADJ, CERMET	10K
RV29	1-228-459-00	RES, ADJ, CERMET	10K
RV30	1-228-459-00	RES, ADJ, CERMET	10K
RV31	1-228-462-00	RES, ADJ, CERMET	100K
RV32	1-228-459-00	RES, ADJ, CERMET	10K
RV33	1-228-459-00	RES, ADJ, CERMET	10K
RV41	1-228-459-00	RES, ADJ, CERMET	10K
RV42	1-228-459-00	RES, ADJ, CERMET	10K
RV43	1-228-459-00	RES, ADJ, CERMET	10K
RV44	1-228-459-00	RES, ADJ, CERMET	10K
RV45	1-228-459-00	RES, ADJ, CERMET	10K
RV46	1-228-459-00	RES, ADJ, CERMET	10K
RV47	1-228-459-00	RES, ADJ, CERMET	10K
RV48	1-228-459-00	RES, ADJ, CERMET	10K
RV49	1-228-459-00	RES, ADJ, CERMET	10K
RV50	1-228-459-00	RES, ADJ, CERMET	10K
RV51	1-228-459-00	RES, ADJ, CERMET	10K
RV52	1-228-459-00	RES, ADJ, CERMET	10K
RV53	1-228-459-00	RES, ADJ, CERMET	10K
RV54	1-228-459-00	RES, ADJ, CERMET	10K
RV55	1-228-459-00	RES, ADJ, CERMET	10K
RV56	1-228-459-00	RES, ADJ, CERMET	10K
RV57	1-228-459-00	RES, ADJ, CERMET	10K
RV58	1-228-459-00	RES, ADJ, CERMET	10K
RV59	1-228-459-00	RES, ADJ, CERMET	10K
RV60	1-228-459-00	RES, ADJ, CERMET	10K
RV61	1-228-462-00	RES, ADJ, CERMET	100K

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*1-627-677-11 V BOARD

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REF.NO.	PART NO.	DESCRIPTION				REMARK
	1-563-265-11	CONNECTOR, MULTIPLE 10P				

<RESISTOR>

R1	1-249-405-11	CARBON	100	5%	1/4W
R2	1-249-405-11	CARBON	100	5%	1/4W
R3	1-249-405-11	CARBON	100	5%	1/4W
R4	1-249-405-11	CARBON	100	5%	1/4W
R5	1-249-405-11	CARBON	100	5%	1/4W
R6	1-249-405-11	CARBON	100	5%	1/4W
R7	1-249-405-11	CARBON	100	5%	1/4W

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*A-1345-731-A EB BOARD, COMPLETE
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*4-373-965-01 INSULATOR (SMALL)
*4-373-966-01 INSULATOR (LARGE)

<CAPACITOR>

C1	1-124-666-11	ELECT	4.7MF	20%	200V
C2	1-124-917-11	ELECT	33MF	20%	25V
C3	1-124-791-11	ELECT	1MF	20%	50V
C4	1-124-357-11	ELECT	33MF	20%	35V
C6	1-130-789-00	FILM	1MF	5%	100V
C7	1-106-375-12	MYLAR	0.022MF	10%	200V
C8	1-124-666-11	ELECT	4.7MF	20%	200V
C9	1-130-479-00	MYLAR	0.0047MF	5%	50V
C10	1-124-122-11	ELECT	100MF	20%	25V
C11	1-102-973-00	CERAMIC	100PF	5%	50V
C12	1-124-122-11	ELECT	100MF	20%	25V
C13	1-136-161-00	FILM	0.047MF	5%	50V
C14	1-124-915-11	ELECT	10MF	20%	50V
C15	1-136-167-00	FILM	0.15MF	5%	50V
C16	1-124-046-00	ELECT	10MF		160V
C17	1-124-046-00	ELECT	10MF	20%	160V
C18	1-124-122-11	ELECT	100MF	20%	25V
C19	1-124-122-11	ELECT	100MF	20%	25V
C20	1-162-129-00	CERAMIC	150PF	10%	2KV
C21	1-136-173-00	FILM	0.47MF	5%	50V
C22	1-102-959-00	CERAMIC	22PF	5%	50V
C23	1-101-880-00	CERAMIC	47PF	5%	50V

<DIODE>

D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D3	8-719-911-19	DIODE 1SS119
D4	8-719-908-03	DIODE GP08D
D5	8-719-908-03	DIODE GP08D
D6	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D9	8-719-911-19	DIODE 1SS119
D10	8-719-911-19	DIODE 1SS119
D21	8-719-911-19	DIODE 1SS119

<COIL>

L1	1-459-123-00	COIL, DUST CORE(PAC)

REF.NO.	PART NO.	DESCRIPTION				REMARK

\<TRANSISTOR\>

Q1	8-729-697-92	TRANSISTOR 2SA979-G
Q2	8-729-140-50	TRANSISTOR 2SC3209LK
Q3	8-729-255-12	TRANSISTOR 2SC2551-0
Q4	8-729-200-17	TRANSISTOR 2SA1091-0
Q5	8-729-208-71	TRANSISTOR 2SC3298B-0
Q6	8-729-208-38	TRANSISTOR 2SA1306A-0
Q7	8-729-386-12	TRANSISTOR 2SB861-C
Q8	8-729-255-12	TRANSISTOR 2SC2551-0
Q9	8-729-697-92	TRANSISTOR 2SA979-G
Q10	8-729-140-96	TRANSISTOR 2SD774-34
Q11	8-729-140-97	TRANSISTOR 2SB734-34
Q12	8-729-306-92	TRANSISTOR 2SD669A-C
Q13	8-729-306-92	TRANSISTOR 2SD669A-C
Q14	8-729-255-12	TRANSISTOR 2SC2551-0
Q15	8-729-255-12	TRANSISTOR 2SC2551-0
Q16	8-729-255-12	TRANSISTOR 2SC2551-0
Q17	8-729-200-17	TRANSISTOR 2SA1091-0
Q18	8-729-119-80	TRANSISTOR 2SC2688-LK
Q19	8-729-119-80	TRANSISTOR 2SC2688-LK

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION	Value	Tol	Power	REMARK
R1	1-249-429-11	CARBON	10K	5%	1/4W	
R2	1-249-433-11	CARBON	22K	5%	1/4W	
R3	1-249-425-11	CARBON	4.7K	5%	1/4W	
R4	1-249-430-11	CARBON	12K	5%	1/4W	
R5	1-249-426-11	CARBON	5.6K	5%	1/4W	
R6	1-249-429-11	CARBON	10K	5%	1/4W	
R7	1-216-489-11	METAL OXIDE	27K	5%	3W	F
R8	1-247-802-11	CARBON	62	5%	1/4W	
R9	1-249-414-11	CARBON	560	5%	1/4W	
R10	1-249-448-11	CARBON	1.2	5%	1/4W	F
R11	1-249-448-11	CARBON	1.2	5%	1/4W	F
R12	1-216-351-00	METAL OXIDE	1.5	5%	1W	F
R13	1-216-431-11	METAL OXIDE	560	5%	1W	F
R14	1-215-866-11	METAL OXIDE	330	5%	1W	F
R15	1-249-425-11	CARBON	4.7K	5%	1/4W	
R16	1-249-423-11	CARBON	3.3K	5%	1/4W	F
R17	1-247-700-11	CARBON	100	5%	1/4W	F
R18	1-215-873-00	METAL OXIDE	4.7K	5%	1W	F
R19	1-249-429-11	CARBON	10K	5%	1/4W	
R20	1-249-429-11	CARBON	10K	5%	1/4W	
R21	1-249-425-11	CARBON	4.7K	5%	1/4W	
R22	1-249-423-11	CARBON	3.3K	5%	1/4W	
R23	1-249-425-11	CARBON	4.7K	5%	1/4W	
R24	1-249-417-11	CARBON	1K	5%	1/4W	
R25	1-249-417-11	CARBON	1K	5%	1/4W	
R26	1-249-421-11	CARBON	2.2K	5%	1/4W	
R27	1-249-421-11	CARBON	2.2K	5%	1/4W	
R28	1-249-405-11	CARBON	100	5%	1/4W	
R29	1-249-452-11	CARBON	2.7	5%	1/4W	F
R30	1-249-452-11	CARBON	2.7	5%	1/4W	F
R31	1-249-407-11	CARBON	150	5%	1/4W	F
R32	1-216-351-00	METAL OXIDE	1.5	5%	1W	F
R33	1-215-421-00	METAL	1K	1%	1/4W	
R34	1-215-445-00	METAL	10K	1%	1/4W	
R35	1-249-423-11	CARBON	3.3K	5%	1/4W	
R36	1-216-465-11	METAL OXIDE	27K	5%	2W	F
R37	1-249-401-11	CARBON	47	5%	1/4W	
R38	1-249-425-11	CARBON	4.7K	5%	1/4W	
R39	1-215-445-00	METAL	10K	1%	1/4W	
R40	1-215-453-00	METAL	22K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION	Value	Tol	Power	REMARK
R41	1-215-421-00	METAL	1K	1%	1/4W	
R42	1-247-688-11	CARBON	10	5%	1/4W	F
R43	1-247-688-11	CARBON	10	5%	1/4W	F
R44	1-215-865-11	METAL OXIDE	220	5%	1W	F
R45	1-247-688-11	CARBON	10	5%	1/4W	F
R51	1-249-411-11	CARBON	330	5%	1/4W	

\<TRANSFORMER\>

T1	1-421-504-00	TRANSFORMER, FERRITE (VPT)
T2	1-407-849-00	TRANSFORMER, D.F

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*A-1345-981-A   DB BOARD, COMPLETE
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3-618-225-00   NUT, PLATE

\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION	Value	Tol	Voltage
C3	1-102-963-00	CERAMIC	33PF	5%	50V
C4	1-136-165-00	FILM	0.1MF	5%	50V
C5	1-136-161-00	FILM	0.047MF	5%	50V
C6	1-161-051-00	CERAMIC	0.01MF	10%	50V
C7	1-124-589-11	ELECT	47MF	20%	16V
C8	1-136-153-00	FILM	0.01MF	5%	50V
C9	1-102-074-00	CERAMIC	0.001MF	10%	50V
C10	1-136-161-00	FILM	0.047MF	5%	50V
C11	1-102-973-00	CERAMIC	100PF	5%	50V
C12	1-136-165-00	FILM	0.1MF	5%	50V
C13	1-136-161-00	FILM	0.047MF	5%	50V
C14	1-102-824-00	CERAMIC	470PF	5%	50V
C15	1-136-165-00	FILM	0.1MF	5%	50V
C16	1-102-074-00	CERAMIC	0.001MF	10%	50V
C17	1-136-153-00	FILM	0.01MF	5%	50V
C18	1-161-051-00	CERAMIC	0.01MF	10%	50V
C19	1-124-589-11	ELECT	47MF	20%	16V
C20	1-124-589-11	ELECT	47MF	20%	16V
C21	1-161-051-00	CERAMIC	0.01MF	10%	50V
C22	1-124-589-11	ELECT	47MF	20%	16V
C23	1-163-157-00	FILM	0.022MF	5%	50V
C24	1-136-165-00	FILM	0.1MF	5%	50V
C25	1-136-153-00	FILM	0.01MF	5%	50V
C26	1-136-161-00	FILM	0.047MF	5%	50V
C27	1-163-157-00	FILM	0.022MF	5%	50V
C28	1-136-165-00	FILM	0.1MF	5%	50V
C29	1-136-153-00	FILM	0.01MF	5%	50V
C30	1-136-161-00	FILM	0.047MF	5%	50V
C31	1-124-589-11	ELECT	47MF	20%	16V
C32	1-161-051-00	CERAMIC	0.01MF	10%	50V
C33	1-102-074-00	CERAMIC	0.001MF	10%	50V
C34	1-136-161-00	FILM	0.047MF	5%	50V
C35	1-102-973-00	CERAMIC	100PF	5%	50V
C36	1-136-165-00	FILM	0.1MF	5%	50V
C37	1-136-161-00	FILM	0.047MF	5%	50V
C38	1-102-824-00	CERAMIC	470PF	5%	50V
C39	1-136-165-00	FILM	0.1MF	5%	50V
C40	1-102-074-00	CERAMIC	0.001MF	10%	50V
C41	1-136-153-00	FILM	0.01MF	5%	50V
C42	1-161-051-00	CERAMIC	0.01MF	10%	50V
C43	1-124-589-11	ELECT	47MF	20%	16V
C44	1-124-589-11	ELECT	47MF	20%	16V
C45	1-102-074-00	CERAMIC	0.001MF	10%	50V

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION			REMARK
C46	1-136-161-00	FILM	0.047MF	5%	50V
C47	1-102-973-00	CERAMIC	100PF	5%	50V
C48	1-136-165-00	FILM	0.1MF	5%	50V
C49	1-136-161-00	FILM	0.047MF	5%	50V
C50	1-108-794-11	MYLAR	0.0015MF	5%	50V
C51	1-136-161-00	FILM	0.047MF	5%	50V
C52	1-102-074-00	CERAMIC	0.001MF	10%	50V
C53	1-101-880-00	CERAMIC	47PF	5%	50V
C54	1-161-051-00	CERAMIC	0.01MF	10%	50V
C55	1-124-589-11	ELECT	47MF	20%	16V
C56	1-124-589-11	ELECT	47MF	20%	16V
C57	1-102-074-00	CERAMIC	0.001MF	10%	50V
C58	1-136-161-00	FILM	0.047MF	5%	50V
C59	1-102-973-00	CERAMIC	100PF	5%	50V
C60	1-136-169-00	FILM	0.22MF	5%	50V
C61	1-136-161-00	FILM	0.047MF	5%	50V
C62	1-102-074-00	CERAMIC	0.001MF	10%	50V
C63	1-136-161-00	FILM	0.047MF	5%	50V
C64	1-102-074-00	CERAMIC	0.001MF	10%	50V
C65	1-101-880-00	CERAMIC	47PF	5%	50V
C66	1-161-051-00	CERAMIC	0.01MF	10%	50V
C67	1-124-589-11	ELECT	47MF	20%	16V
C68	1-124-589-11	ELECT	47MF	20%	16V
C69	1-161-051-00	CERAMIC	0.01MF	10%	50V
C70	1-102-074-00	CERAMIC	0.001MF	10%	50V
C71	1-124-589-11	ELECT	47MF	20%	16V
C72	1-126-096-11	ELECT	10MF	20%	25V
C73	1-126-096-11	ELECT	10MF	20%	25V
C74	1-126-096-11	ELECT	10MF	20%	25V
C75	1-126-096-11	ELECT	10MF	20%	25V
C76	1-126-096-11	ELECT	10MF	20%	25V
C77	1-126-096-11	ELECT	10MF	20%	25V
C78	1-161-051-00	CERAMIC	0.01MF	10%	50V
C81	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C83	1-136-167-00	FILM	0.15MF	5%	50V
C84	1-161-051-00	CERAMIC	0.01MF	10%	50V
C87	1-101-361-00	CERAMIC	150PF	5%	50V
C88	1-161-051-00	CERAMIC	0.01MF	10%	50V
C89	1-161-051-00	CERAMIC	0.01MF	10%	50V

<DIODE>

D2	8-719-109-97	DIODE	RD6.8ESB2
D3	8-719-911-19	DIODE	1SS119
D4	8-719-911-19	DIODE	1SS119
D5	8-719-911-19	DIODE	1SS119
D6	8-719-110-03	DIODE	RD7.5ESB2
D7	8-719-110-03	DIODE	RD7.5ESB2
D8	8-719-109-97	DIODE	RD6.8ESB2
D10	8-719-911-19	DIODE	1SS119

<CONNECTOR>

DB1	*1-566-062-11	PIN, CONNECTOR	10P
DB2	*1-566-054-11	PIN, CONNECTOR	2P
DB3	*1-566-055-11	PIN, CONNECTOR	3P
DB4	*1-566-055-11	PIN, CONNECTOR	3P
DB5	*1-566-055-11	PIN, CONNECTOR	3P
DB6	*1-566-062-11	PIN, CONNECTOR	10P
DB7	*1-566-062-11	PIN, CONNECTOR	10P

<IC>

IC1	8-759-145-58	IC UPC4558C

IC2	8-759-145-58	IC UPC4558C
IC3	8-759-145-58	IC UPC4558C
IC4	8-759-145-58	IC UPC4558C
IC5	8-759-145-58	IC UPC4558C
IC6	8-759-145-58	IC UPC4558C
IC7	8-759-145-58	IC UPC4558C
IC8	8-759-145-58	IC UPC4558C
IC11	8-759-140-53	IC UPD4053BC
IC12	8-759-145-58	IC UPC4558C
IC13	8-759-929-62	IC LM7812CT
IC14	8-759-929-65	IC LM7912CT
IC15	8-759-345-38	IC HD14538BP
IC16	8-759-729-03	IC NJM2903D

<COIL>

L1	1-408-236-00	INDUCTOR	2.7MMH
L2	1-408-236-00	INDUCTOR	2.7MMH
L3	1-408-238-00	INDUCTOR	3.9MMH
L4	1-408-237-00	INDUCTOR	3.3MMH

<TRANSISTOR>

Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q4	8-729-900-36	TRANSISTOR DTC124ES
Q5	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q6	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q7	8-729-201-05	TRANSISTOR 2SC2878-B
Q8	8-729-119-78	TRANSISTOR 2SG2785-HFE
Q9	8-729-106-07	TRANSISTOR 2SK514-H
Q10	8-729-900-36	TRANSISTOR DTC124ES
Q11	8-729-201-05	TRANSISTOR 2SC2878-B
Q12	8-729-201-05	TRANSISTOR 2SC2878-B
Q13	8-729-106-07	TRANSISTOR 2SK514-H
Q14	8-729-900-36	TRANSISTOR DTC124ES
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q16	8-729-106-07	TRANSISTOR 2SK514-H
Q17	8-729-900-36	TRANSISTOR DTC124ES
Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q19	8-729-201-05	TRANSISTOR 2SC2878-B
Q20	8-729-201-05	TRANSISTOR 2SC2878-B
Q21	8-729-201-05	TRANSISTOR 2SC2878-B
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q23	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q24	8-729-106-07	TRANSISTOR 2SK514-H
Q25	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q26	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q27	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q28	8-729-106-07	TRANSISTOR 2SK514-H
Q29	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q30	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q31	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q32	8-729-106-07	TRANSISTOR 2SK514-H
Q33	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q34	8-729-173-38	TRANSISTOR 2SA733-K
Q35	8-729-173-38	TRANSISTOR 2SA733-K
Q36	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q37	8-729-900-36	TRANSISTOR DTC124ES
Q38	8-729-173-38	TRANSISTOR 2SA733-K
Q40	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q41	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q43	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q44	8-729-173-38	TRANSISTOR 2SA733-K

REF.NO.	PART NO.	DESCRIPTION				REMARK
Q47	8-729-900-65	TRANSISTOR DTA144ES				
Q49	8-729-900-89	TRANSISTOR DTC144ES				
Q101	8-729-900-89	TRANSISTOR DTC144ES				
		<RESISTOR>				
R3	1-249-423-11	CARBON	3.3K	5%	1/4W	
R4	1-249-441-11	CARBON	100K	5%	1/4W	
R5	1-249-429-11	CARBON	10K	5%	1/4W	
R6	1-249-420-11	CARBON	1.8K	5%	1/4W	
R7	1-249-429-11	CARBON	10K	5%	1/4W	
R8	1-249-429-11	CARBON	10K	5%	1/4W	
R9	1-249-425-11	CARBON	4.7K	5%	1/4W	
R10	1-215-467-00	METAL	82K	1%	1/4W	
R11	1-215-439-00	METAL	5.6K	1%	1/4W	
R12	1-215-477-00	METAL	220K	1%	1/4W	
R13	1-249-429-11	CARBON	10K	5%	1/4W	
R14	1-249-433-11	CARBON	22K	5%	1/4W	
R15	1-249-433-11	CARBON	22K	5%	1/4W	
R16	1-249-441-11	CARBON	100K	5%	1/4W	
R17	1-249-433-11	CARBON	22K	5%	1/4W	
R18	1-215-477-00	METAL	220K	1%	1/4W	
R19	1-249-429-11	CARBON	10K	5%	1/4W	
R20	1-249-433-11	CARBON	22K	5%	1/4W	
R21	1-249-433-11	CARBON	22K	5%	1/4W	
R22	1-249-441-11	CARBON	100K	5%	1/4W	
R23	1-249-429-11	CARBON	10K	5%	1/4W	
R24	1-215-453-00	METAL	22K	1%	1/4W	
R25	1-249-405-11	CARBON	100	5%	1/4W	
R26	1-249-417-11	CARBON	1K	5%	1/4W	
R27	1-249-433-11	CARBON	22K	5%	1/4W	
R28	1-249-425-11	CARBON	4.7K	5%	1/4W	
R29	1-249-435-11	CARBON	33K	5%	1/4W	
R30	1-249-421-11	CARBON	2.2K	5%	1/4W	
R31	1-249-417-11	CARBON	1K	5%	1/4W	
R32	1-249-433-11	CARBON	22K	5%	1/4W	
R33	1-249-425-11	CARBON	4.7K	5%	1/4W	
R34	1-247-903-00	CARBON	1M	5%	1/4W	
R35	1-249-429-11	CARBON	10K	5%	1/4W	
R36	1-249-429-11	CARBON	10K	5%	1/4W	
R37	1-249-429-11	CARBON	10K	5%	1/4W	
R38	1-215-445-00	METAL	10K	1%	1/4W	
R39	1-215-445-00	METAL	10K	1%	1/4W	
R40	1-249-429-11	CARBON	10K	5%	1/4W	
R42	1-249-441-11	CARBON	100K	5%	1/4W	
R43	1-249-405-11	CARBON	100	5%	1/4W	
R44	1-249-417-11	CARBON	1K	5%	1/4W	
R45	1-215-445-00	METAL	10K	1%	1/4W	
R46	1-215-445-00	METAL	10K	1%	1/4W	
R47	1-249-429-11	CARBON	10K	5%	1/4W	
R48	1-247-895-00	CARBON	470K	5%	1/4W	
R49	1-215-451-00	METAL	18K	1%	1/4W	
R50	1-215-451-00	METAL	18K	1%	1/4W	
R51	1-249-429-11	CARBON	10K	5%	1/4W	
R52	1-215-451-00	METAL	18K	1%	1/4W	
R53	1-247-895-00	CARBON	470K	5%	1/4W	
R54	1-215-451-00	METAL	18K	1%	1/4W	
R55	1-249-429-11	CARBON	10K	5%	1/4W	
R57	1-249-405-11	CARBON	100	5%	1/4W	
R58	1-249-405-11	CARBON	100	5%	1/4W	
R59	1-249-421-11	CARBON	2.2K	5%	1/4W	
R60	1-215-445-00	METAL	10K	1%	1/4W	
R61	1-249-429-11	CARBON	10K	5%	1/4W	
R62	1-215-445-00	METAL	10K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R63	1-215-453-00	METAL	22K	1%	1/4W	
R64	1-249-429-11	CARBON	10K	5%	1/4W	
R65	1-249-405-11	CARBON	100	5%	1/4W	
R66	1-249-417-11	CARBON	1K	5%	1/4W	
R67	1-249-433-11	CARBON	22K	5%	1/4W	
R68	1-249-425-11	CARBON	4.7K	5%	1/4W	
R69	1-249-435-11	CARBON	33K	5%	1/4W	
R70	1-249-421-11	CARBON	2.2K	5%	1/4W	
R71	1-249-417-11	CARBON	1K	5%	1/4W	
R72	1-249-433-11	CARBON	22K	5%	1/4W	
R73	1-249-425-11	CARBON	4.7K	5%	1/4W	
R74	1-247-903-00	CARBON	1M	5%	1/4W	
R75	1-249-429-11	CARBON	10K	5%	1/4W	
R76	1-249-429-11	CARBON	10K	5%	1/4W	
R77	1-249-429-11	CARBON	10K	5%	1/4W	
R78	1-215-469-00	METAL	100K	1%	1/4W	
R79	1-249-405-11	CARBON	100	5%	1/4W	
R80	1-249-417-11	CARBON	1K	5%	1/4W	
R81	1-249-433-11	CARBON	22K	5%	1/4W	
R82	1-249-425-11	CARBON	4.7K	5%	1/4W	
R83	1-249-435-11	CARBON	33K	5%	1/4W	
R84	1-249-421-11	CARBON	2.2K	5%	1/4W	
R85	1-249-417-11	CARBON	1K	5%	1/4W	
R86	1-249-433-11	CARBON	22K	5%	1/4W	
R87	1-249-425-11	CARBON	4.7K	5%	1/4W	
R88	1-247-895-00	CARBON	470K	5%	1/4W	
R89	1-247-895-00	CARBON	470K	5%	1/4W	
R90	1-249-429-11	CARBON	10K	5%	1/4W	
R91	1-249-429-11	CARBON	10K	5%	1/4W	
R92	1-215-469-00	METAL	100K	1%	1/4W	
R93	1-249-405-11	CARBON	100	5%	1/4W	
R94	1-249-417-11	CARBON	1K	5%	1/4W	
R95	1-249-433-11	CARBON	22K	5%	1/4W	
R96	1-249-425-11	CARBON	4.7K	5%	1/4W	
R97	1-249-435-11	CARBON	33K	5%	1/4W	
R98	1-249-421-11	CARBON	2.2K	5%	1/4W	
R99	1-249-412-11	CARBON	390	5%	1/4W	
R100	1-249-433-11	CARBON	22K	5%	1/4W	
R101	1-249-425-11	CARBON	4.7K	5%	1/4W	
R102	1-247-895-00	CARBON	470K	5%	1/4W	
R103	1-247-895-00	CARBON	470K	5%	1/4W	
R104	1-249-429-11	CARBON	10K	5%	1/4W	
R105	1-249-429-11	CARBON	10K	5%	1/4W	
R106	1-215-397-00	METAL	100	1%	1/4W	
R107	1-249-393-11	CARBON	10	5%	1/4W	F
R108	1-249-393-11	CARBON	10	5%	1/4W	F
R109	1-249-429-11	CARBON	10K	5%	1/4W	
R110	1-215-437-00	METAL	4.7K	1%	1/4W	
R111	1-249-421-11	CARBON	2.2K	5%	1/4W	
R112	1-249-405-11	CARBON	100	5%	1/4W	
R113	1-249-429-11	CARBON	10K	5%	1/4W	
R114	1-215-441-00	METAL	6.8K	1%	1/4W	
R115	1-215-469-00	METAL	100K	1%	1/4W	
R116	1-249-421-11	CARBON	2.2K	5%	1/4W	
R117	1-249-405-11	CARBON	100	5%	1/4W	
R118	1-249-405-11	CARBON	100	5%	1/4W	
R120	1-215-421-00	METAL	1K	1%	1/4W	
R121	1-249-425-11	CARBON	4.7K	5%	1/4W	
R122	1-215-461-00	METAL	47K	1%	1/4W	
R123	1-215-437-00	METAL	4.7K	1%	1/4W	
R124	1-215-437-00	METAL	4.7K	1%	1/4W	
R125	1-215-469-00	METAL	100K	1%	1/4W	
R126	1-249-435-11	CARBON	33K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R128	1-202-731-00	SOLID	10M	5%	1/2W	
R129	1-215-479-00	METAL	270K	1%	1/4W	
R130	1-247-830-11	CARBON	910	5%	1/4W	
R132	1-247-830-11	CARBON	910	5%	1/4W	
R169	1-247-903-00	CARBON	1M	5%	1/4W	
R170	1-247-903-00	CARBON	1M	5%	1/4W	
R171	1-249-441-11	CARBON	100K	5%	1/4W	
R172	1-249-429-11	CARBON	10K	5%	1/4W	
R173	1-249-429-11	CARBON	10K	5%	1/4W	
R174	1-249-421-11	CARBON	2.2K	5%	1/4W	
R175	1-249-421-11	CARBON	2.2K	5%	1/4W	
R176	1-249-425-11	CARBON	4.7K	5%	1/4W	
R177	1-249-421-11	CARBON	2.2K	5%	1/4W	
R185	1-249-417-11	CARBON	1K	5%	1/4W	
R186	1-249-429-11	CARBON	10K	5%	1/4W	
R187	1-249-435-11	CARBON	33K	5%	1/4W	
R188	1-249-429-11	CARBON	10K	5%	1/4W	
R189	1-249-435-11	CARBON	33K	5%	1/4W	
R190	1-249-417-11	CARBON	1K	5%	1/4W	
R191	1-249-423-11	CARBON	3.3K	5%	1/4W	
R192	1-215-453-00	METAL	22K	1%	1/4W	
R193	1-249-417-11	CARBON	1K	5%	1/4W	
R194	1-249-417-11	CARBON	1K	5%	1/4W	
R195	1-249-429-11	CARBON	10K	5%	1/4W	
R301	1-249-437-11	CARBON	47K	5%	1/4W	

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*A-1345-982-A   DA BOARD, COMPLETE
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3-618-225-00 NUT, PLATE

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			
C1	1-126-157-11	ELECT	10MF	20%	16V
C2	1-126-157-11	ELECT	10MF	20%	16V
C3	1-161-051-00	CERAMIC	0.01MF	10%	50V
C4	1-101-361-00	CERAMIC	150PF	5%	50V
C5	1-161-051-00	CERAMIC	0.01MF	10%	50V
C6	1-161-051-00	CERAMIC	0.01MF	10%	50V
C7	1-101-361-00	CERAMIC	150PF	5%	50V
C8	1-102-527-11	CERAMIC	82PF	5%	50V
C9	1-101-361-00	CERAMIC	150PF	5%	50V
C10	1-106-359-00	MYLAR	0.0047MF	5%	100V
C11	1-130-738-00	FILM	0.015MF	5%	100V
C12	1-163-157-00	FILM	0.022MF	5%	50V
C13	1-136-155-00	FILM	0.015MF	5%	50V
C14	1-163-157-00	FILM	0.022MF	5%	50V
C15	1-130-479-00	MYLAR	0.0047MF	5%	50V
C16	1-124-589-11	ELECT	47MF	20%	16V
C17	1-124-234-00	ELECT	22MF	20%	16V
C18	1-124-234-00	ELECT	22MF	20%	16V
C19	1-161-051-00	CERAMIC	0.01MF	10%	50V
C20	1-130-871-11	FILM	0.01MF	5%	50V
C21	1-126-301-11	ELECT	1MF	20%	50V
C22	1-130-871-11	FILM	0.01MF	5%	50V
C23	1-126-301-11	ELECT	1MF	20%	50V
C24	1-126-301-11	ELECT	1MF	20%	50V
C25	1-126-301-11	ELECT	1MF	20%	50V
C26	1-161-051-00	CERAMIC	0.01MF	10%	50V
C27	1-126-157-11	ELECT	10MF	20%	16V
C28	1-126-157-11	ELECT	10MF	20%	16V
C29	1-126-301-11	ELECT	1MF	20%	50V
C30	1-161-051-00	CERAMIC	0.01MF	10%	50V

REF.NO.	PART NO.	DESCRIPTION				REMARK
C31	1-102-973-00	CERAMIC	100PF	5%	50V	
C32	1-101-361-00	CERAMIC	150PF	5%	50V	
C33	1-130-871-11	FILM	0.01MF	5%	50V	
C34	1-126-301-11	ELECT	1MF	20%	50V	
C35	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C36	1-102-824-00	CERAMIC	470PF	5%	50V	
C38	1-102-824-00	CERAMIC	470PF	5%	50V	
C39	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C40	1-130-871-11	FILM	0.01MF	5%	50V	
C41	1-126-301-11	ELECT	1MF	20%	50V	
C42	1-130-871-11	FILM	0.01MF	5%	50V	
C43	1-126-301-11	ELECT	1MF	20%	50V	
C44	1-124-465-00	ELECT	0.47MF	20%	50V	
C45	1-126-157-11	ELECT	10MF	20%	16V	
C46	1-126-157-11	ELECT	10MF	20%	16V	
C47	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C48	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C49	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C50	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C51	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C52	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C53	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C54	1-126-157-11	ELECT	10MF	20%	16V	
C55	1-126-157-11	ELECT	10MF	20%	16V	
C56	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C57	1-136-474-11	FILM	0.1MF	5%	100V	
C58	1-130-871-11	FILM	0.01MF	5%	50V	
C59	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C60	1-130-871-11	FILM	0.01MF	5%	50V	
C61	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C62	1-130-871-11	FILM	0.01MF	5%	50V	
C63	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C64	1-130-871-11	FILM	0.01MF	5%	50V	
C65	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C66	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C67	1-126-163-11	ELECT	4.7MF	20%	25V	
C68	1-101-361-00	CERAMIC	150PF	5%	50V	
C69	1-126-157-11	ELECT	10MF	20%	16V	
C70	1-126-157-11	ELECT	10MF	20%	16V	
C71	1-126-157-11	ELECT	10MF	20%	16V	
C72	1-126-157-11	ELECT	10MF	20%	16V	
C73	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C74	1-126-157-11	ELECT	10MF	20%	16V	
C75	1-126-157-11	ELECT	10MF	20%	16V	
C76	1-136-165-00	FILM	0.1MF	5%	50V	
C77	1-136-165-00	FILM	0.1MF	5%	50V	
C78	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C80	1-101-004-00	CERAMIC	0.01MF		50V	
C90	1-136-161-00	FILM	0.047MF	5%	50V	
C100	1-136-165-00	FILM	0.1MF	5%	50V	
C101	1-136-165-00	FILM	0.1MF	5%	50V	
C102	1-102-978-00	CERAMIC	220PF	5%	50V	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	
D1	8-719-911-19	DIODE	1SS119
D2	8-719-911-19	DIODE	1SS119
D3	8-719-109-97	DIODE	RD6.8ESB2
D4	8-719-109-97	DIODE	RD6.8ESB2
D5	8-719-110-31	DIODE	RD12ESB2
D6	8-719-110-31	DIODE	RD12ESB2
D7	8-719-911-19	DIODE	1SS119
D8	8-719-911-19	DIODE	1SS119
D9	8-719-110-03	DIODE	RD7.5ESB2

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REMARK
D10	8-719-110-03	DIODE RD7.5ESB2	
D11	8-719-110-41	DIODE RD15ESB2	
D12	8-719-109-89	DIODE RD5.6ESB2	
D13	8-719-911-19	DIODE 1SS119	
D14	8-719-911-19	DIODE 1SS119	
D15	8-719-911-19	DIODE 1SS119	
D18	8-719-911-19	DIODE 1SS119	
D19	8-719-911-19	DIODE 1SS119	

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION
DA1	*1-566-060-11	PIN, CONNECTOR 8P
DA2	*1-566-056-11	PIN, CONNECTOR 4P
DA3	*1-566-062-11	PIN, CONNECTOR 10P
DA4	*1-566-058-11	PIN, CONNECTOR 6P
DA5	*1-566-055-11	PIN, CONNECTOR 3P
DA6	*1-566-058-11	PIN, CONNECTOR 6P
DA7	*1-566-056-11	PIN, CONNECTOR 4P

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-984-27	IC MB84027B
IC2	8-759-040-11	IC MC14011BCP
IC3	8-759-000-58	IC MC14093BCP
IC4	8-751-580-00	IC CX-158
IC5	8-759-990-82	IC TL082CP
IC6	8-759-990-82	IC TL082CP
IC7	8-759-014-96	IC MC1496P
IC8	8-759-729-03	IC NJM2903D
IC9	8-759-990-82	IC TL082CP
IC10	8-759-729-03	IC NJM2903D
IC11	8-759-990-82	IC TL082CP
IC12	8-759-014-96	IC MC1496P
IC13	8-759-000-49	IC MC14066BCP
IC14	8-759-000-49	IC MC14066BCP
IC15	8-759-000-49	IC MC14066BCP
IC16	8-759-000-49	IC MC14066BCP
IC17	8-759-145-58	IC UPC4558C
IC18	8-759-909-70	IC CX23025
IC19	8-759-145-58	IC UPC4558C
IC20	8-759-145-58	IC UPC4558C
IC21	8-759-145-58	IC UPC4558C
IC22	8-759-145-58	IC UPC4558C
IC23	8-759-145-58	IC UPC4558C
IC24	8-759-929-62	IC LM7812CT
IC25	8-759-929-65	IC LM7912CT
IC26	8-759-990-82	IC TL082CP

<COIL>

REF.NO.	PART NO.	DESCRIPTION	
L1	1-407-504-00	INDUCTOR	10MMH

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-900-89	TRANSISTOR DTC144ES
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q5	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q6	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q9	8-729-800-10	TRANSISTOR 2SC3068
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q12	8-729-900-89	TRANSISTOR DTC144ES
Q13	8-729-900-89	TRANSISTOR DTC144ES
Q14	8-729-900-89	TRANSISTOR DTC144ES
Q15	8-729-900-89	TRANSISTOR DTC144ES
Q16	8-729-900-89	TRANSISTOR DTC144ES
Q17	8-729-900-89	TRANSISTOR DTC144ES
Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q19	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q20	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q21	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q23	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q24	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q31	8-729-900-89	TRANSISTOR DTC144ES

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-215-461-00	METAL	47K	1%	1/4W	
R2	1-249-417-11	CARBON	1K	5%	1/4W	
R3	1-249-430-11	CARBON	12K	5%	1/4W	
R4	1-249-417-11	CARBON	1K	5%	1/4W	
R5	1-249-422-11	CARBON	2.7K	5%	1/4W	
R6	1-247-840-00	CARBON	2.4K	5%	1/4W	
R7	1-215-462-00	METAL	51K	1%	1/4W	
R8	1-249-417-11	CARBON	1K	5%	1/4W	
R9	1-249-417-11	CARBON	1K	5%	1/4W	
R10	1-249-423-11	CARBON	3.3K	5%	1/4W	
R11	1-249-419-11	CARBON	1.5K	5%	1/4W	
R12	1-249-429-11	CARBON	10K	5%	1/4W	
R13	1-249-424-11	CARBON	3.9K	5%	1/4W	
R14	1-249-419-11	CARBON	1.5K	5%	1/4W	
R15	1-249-410-11	CARBON	270	5%	1/4W	
R16	1-249-417-11	CARBON	1K	5%	1/4W	
R17	1-215-427-00	METAL	1.8K	1%	1/4W	
R18	1-215-435-00	METAL	3.9K	1%	1/4W	
R19	1-215-443-00	METAL	8.2K	1%	1/4W	
R20	1-249-400-11	CARBON	39	5%	1/4W	F
R21	1-249-429-11	CARBON	10K	5%	1/4W	
R22	1-215-445-00	METAL	10K	1%	1/4W	
R23	1-249-429-11	CARBON	10K	5%	1/4W	
R24	1-249-427-11	CARBON	6.8K	5%	1/4W	
R25	1-249-393-11	CARBON	10	5%	1/4W	
R26	1-215-439-00	METAL	5.6K	1%	1/4W	
R27	1-249-429-11	CARBON	10K	5%	1/4W	
R28	1-215-421-00	METAL	1K	1%	1/4W	
R29	1-215-458-00	METAL	36K	1%	1/4W	
R30	1-249-429-11	CARBON	10K	5%	1/4W	
R31	1-249-427-11	CARBON	6.8K	5%	1/4W	
R32	1-249-393-11	CARBON	10	5%	1/4W	
R33	1-249-425-11	CARBON	4.7K	5%	1/4W	
R34	1-249-424-11	CARBON	3.9K	5%	1/4W	
R35	1-247-800-11	CARBON	51	5%	1/4W	
R36	1-249-417-11	CARBON	1K	5%	1/4W	
R37	1-249-417-11	CARBON	1K	5%	1/4W	
R38	1-249-417-11	CARBON	1K	5%	1/4W	
R39	1-249-417-11	CARBON	1K	5%	1/4W	
R40	1-249-417-11	CARBON	1K	5%	1/4W	
R41	1-247-800-11	CARBON	51	5%	1/4W	
R42	1-249-430-11	CARBON	12K	5%	1/4W	
R43	1-249-419-11	CARBON	1.5K	5%	1/4W	
R44	1-249-424-11	CARBON	3.9K	5%	1/4W	
R45	1-249-429-11	CARBON	10K	5%	1/4W	
R46	1-249-429-11	CARBON	10K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R47	1-249-431-11	CARBON	15K	5%	1/4W	
R48	1-249-429-11	CARBON	10K	5%	1/4W	
R49	1-249-429-11	CARBON	10K	5%	1/4W	
R50	1-249-429-11	CARBON	10K	5%	1/4W	
R51	1-249-429-11	CARBON	10K	5%	1/4W	
R52	1-249-417-11	CARBON	1K	5%	1/4W	
R53	1-247-903-00	CARBON	1M	5%	1/4W	
R54	1-249-421-11	CARBON	2.2K	5%	1/4W	
R55	1-249-417-11	CARBON	1K	5%	1/4W	
R56	1-249-435-11	CARBON	33K	5%	1/4W	
R57	1-249-429-11	CARBON	10K	5%	1/4W	
R58	1-249-423-11	CARBON	3.3K	5%	1/4W	
R59	1-249-429-11	CARBON	10K	5%	1/4W	
R60	1-215-445-00	METAL	10K	1%	1/4W	
R61	1-249-429-11	CARBON	10K	5%	1/4W	
R62	1-249-427-11	CARBON	6.8K	5%	1/4W	
R63	1-249-393-11	CARBON	10	5%	1/4W	
R64	1-249-429-11	CARBON	10K	5%	1/4W	
R65	1-249-433-11	CARBON	22K	5%	1/4W	
R66	1-249-433-11	CARBON	22K	5%	1/4W	
R67	1-249-429-11	CARBON	10K	5%	1/4W	
R68	1-247-903-00	CARBON	1M	5%	1/4W	
R69	1-249-421-11	CARBON	2.2K	5%	1/4W	
R70	1-249-435-11	CARBON	33K	5%	1/4W	
R71	1-249-429-11	CARBON	10K	5%	1/4W	
R72	1-249-423-11	CARBON	3.3K	5%	1/4W	
R74	1-249-429-11	CARBON	10K	5%	1/4W	
R76	1-249-433-11	CARBON	22K	5%	1/4W	
R77	1-249-439-11	CARBON	68K	5%	1/4W	
R79	1-249-421-11	CARBON	2.2K	5%	1/4W	
R80	1-249-435-11	CARBON	33K	5%	1/4W	
R81	1-249-429-11	CARBON	10K	5%	1/4W	
R82	1-249-423-11	CARBON	3.3K	5%	1/4W	
R83	1-249-429-11	CARBON	10K	5%	1/4W	
R84	1-215-445-00	METAL	10K	1%	1/4W	
R85	1-249-427-11	CARBON	6.8K	5%	1/4W	
R86	1-249-429-11	CARBON	10K	5%	1/4W	
R87	1-249-393-11	CARBON	10	5%	1/4W	
R88	1-249-429-11	CARBON	10K	5%	1/4W	
R89	1-249-429-11	CARBON	10K	5%	1/4W	
R90	1-249-417-11	CARBON	1K	5%	1/4W	
R91	1-249-429-11	CARBON	10K	5%	1/4W	
R92	1-249-435-11	CARBON	33K	5%	1/4W	
R93	1-249-393-11	CARBON	10	5%	1/4W	
R94	1-247-848-11	CARBON	5.1K	5%	1/4W	
R95	1-249-417-11	CARBON	1K	5%	1/4W	
R96	1-249-429-11	CARBON	10K	5%	1/4W	
R97	1-249-433-11	CARBON	22K	5%	1/4W	
R98	1-249-409-11	CARBON	220	5%	1/4W	
R99	1-249-405-11	CARBON	100	5%	1/4W	
R100	1-249-417-11	CARBON	1K	5%	1/4W	
R101	1-249-405-11	CARBON	100	5%	1/4W	
R102	1-249-430-11	CARBON	12K	5%	1/4W	
R103	1-249-424-11	CARBON	3.9K	5%	1/4W	
R104	1-247-800-11	CARBON	51	5%	1/4W	
R105	1-249-417-11	CARBON	1K	5%	1/4W	
R106	1-249-417-11	CARBON	1K	5%	1/4W	
R107	1-249-424-11	CARBON	3.9K	5%	1/4W	
R109	1-249-437-11	CARBON	47K	5%	1/4W	
R110	1-249-430-11	CARBON	12K	5%	1/4W	
R111	1-249-437-11	CARBON	47K	5%	1/4W	
R112	1-249-426-11	CARBON	5.6K	5%	1/4W	
R113	1-249-430-11	CARBON	12K	5%	1/4W	
R114	1-249-437-11	CARBON	47K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R115	1-247-830-11	CARBON	910	5%	1/4W	
R116	1-247-830-11	CARBON	910	5%	1/4W	
R123	1-215-445-00	METAL	10K	1%	1/4W	
R124	1-215-433-00	METAL	3.3K	1%	1/4W	
R125	1-215-443-00	METAL	8.2K	1%	1/4W	
R126	1-215-437-00	METAL	4.7K	1%	1/4W	
R127	1-249-417-11	CARBON	1K	5%	1/4W	
R128	1-249-417-11	CARBON	1K	5%	1/4W	
R129	1-249-405-11	CARBON	100	5%	1/4W	
R130	1-249-429-11	CARBON	10K	5%	1/4W	
R131	1-215-445-00	METAL	10K	1%	1/4W	
R132	1-215-445-00	METAL	10K	1%	1/4W	
R133	1-215-461-00	METAL	47K	1%	1/4W	
R134	1-215-447-00	METAL	12K	1%	1/4W	
R135	1-249-427-11	CARBON	6.8K	5%	1/4W	
R136	1-249-429-11	CARBON	10K	5%	1/4W	
R137	1-249-405-11	CARBON	100	5%	1/4W	
R138	1-249-417-11	CARBON	1K	5%	1/4W	
R139	1-249-417-11	CARBON	1K	5%	1/4W	
R140	1-215-421-00	METAL	1K	1%	1/4W	
R141	1-249-429-11	CARBON	10K	5%	1/4W	
R142	1-215-457-00	METAL	33K	1%	1/4W	
R143	1-215-457-00	METAL	33K	1%	1/4W	
R144	1-249-429-11	CARBON	10K	5%	1/4W	
R145	1-215-481-00	METAL	330K	1%	1/4W	
R146	1-249-429-11	CARBON	10K	5%	1/4W	
R147	1-249-433-11	CARBON	22K	5%	1/4W	
R148	1-249-405-11	CARBON	100	5%	1/4W	
R149	1-215-421-00	METAL	1K	1%	1/4W	
R150	1-215-457-00	METAL	33K	1%	1/4W	
R151	1-215-457-00	METAL	33K	1%	1/4W	
R152	1-215-481-00	METAL	330K	1%	1/4W	
R153	1-215-431-00	METAL	2.7K	1%	1/4W	
R154	1-215-413-00	METAL	470	1%	1/4W	
R155	1-249-429-11	CARBON	10K	5%	1/4W	
R156	1-249-429-11	CARBON	10K	5%	1/4W	
R157	1-249-433-11	CARBON	22K	5%	1/4W	
R158	1-249-405-11	CARBON	100	5%	1/4W	
R159	1-249-429-11	CARBON	10K	5%	1/4W	
R160	1-247-897-11	CARBON	560K	5%	1/4W	
R161	1-215-455-00	METAL	27K	1%	1/4W	
R162	1-215-445-00	METAL	10K	1%	1/4W	
R163	1-215-445-00	METAL	10K	1%	1/4W	
R164	1-215-461-00	METAL	47K	1%	1/4W	
R165	1-215-461-00	METAL	47K	1%	1/4W	
R166	1-215-485-00	METAL	470K	1%	1/4W	
R167	1-249-429-11	CARBON	10K	5%	1/4W	
R168	1-249-429-11	CARBON	10K	5%	1/4W	
R169	1-249-433-11	CARBON	22K	5%	1/4W	
R170	1-249-405-11	CARBON	100	5%	1/4W	
R171	1-249-429-11	CARBON	10K	5%	1/4W	
R172	1-215-445-00	METAL	10K	1%	1/4W	
R173	1-215-445-00	METAL	10K	1%	1/4W	
R174	1-215-457-00	METAL	33K	1%	1/4W	
R175	1-215-457-00	METAL	33K	1%	1/4W	
R176	1-215-481-00	METAL	330K	1%	1/4W	
R177	1-249-429-11	CARBON	10K	5%	1/4W	
R178	1-247-903-00	CARBON	1M	5%	1/4W	
R179	1-249-429-11	CARBON	10K	5%	1/4W	
R180	1-249-433-11	CARBON	22K	5%	1/4W	
R181	1-249-405-11	CARBON	100	5%	1/4W	
R182	1-215-451-00	METAL	18K	1%	1/4W	
R183	1-249-429-11	CARBON	10K	5%	1/4W	

DA	EA

REF.NO.	PART NO.	DESCRIPTION				REMARK
R184	1-215-477-00	METAL	220K	1%	1/4W	
R185	1-215-445-00	METAL	10K	1%	1/4W	
R186	1-215-445-00	METAL	10K	1%	1/4W	
R189	1-215-405-00	METAL	220	1%	1/4W	
R190	1-215-433-00	METAL	3.3K	1%	1/4W	
R191	1-215-405-00	METAL	220	1%	1/4W	
R192	1-215-433-00	METAL	3.3K	1%	1/4W	
R193	1-249-433-11	CARBON	22K	5%	1/4W	
R194	1-249-417-11	CARBON	1K	5%	1/4W	
R195	1-249-417-11	CARBON	1K	5%	1/4W	
R196	1-249-429-11	CARBON	10K	5%	1/4W	
R197	1-249-429-11	CARBON	10K	5%	1/4W	
R198	1-215-475-00	METAL	180K	1%	1/4W	
R200	1-215-445-00	METAL	10K	1%	1/4W	
R201	1-249-429-11	CARBON	10K	5%	1/4W	
R202	1-249-429-11	CARBON	10K	5%	1/4W	
R203	1-249-429-11	CARBON	10K	5%	1/4W	
R204	1-249-429-11	CARBON	10K	5%	1/4W	
R205	1-249-437-11	CARBON	47K	5%	1/4W	
R206	1-249-417-11	CARBON	1K	5%	1/4W	
R207	1-249-433-11	CARBON	22K	5%	1/4W	
R208	1-249-437-11	CARBON	47K	5%	1/4W	
R209	1-249-429-11	CARBON	10K	5%	1/4W	
R210	1-249-429-11	CARBON	10K	5%	1/4W	
R211	1-249-429-11	CARBON	10K	5%	1/4W	
R220	1-249-439-11	CARBON	68K	5%	1/4W	
R221	1-249-428-11	CARBON	8.2K	5%	1/4W	
R223	1-249-433-11	CARBON	22K	5%	1/4W	
R224	1-249-433-11	CARBON	22K	5%	1/4W	
R290	1-215-443-00	METAL	8.2K	1%	1/4W	
R301	1-215-440-00	METAL	6.2K	1%	1/4W	
R302	1-215-445-00	METAL	10K	1%	1/4W	
R303	1-249-419-11	CARBON	1.5K	5%	1/4W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION
RV1	1-237-521-21	RES, ADJ, CERMET 100K
RV2	1-237-522-21	RES, ADJ, CERMET 200K
RV3	1-237-521-21	RES, ADJ, CERMET 100K
RV4	1-237-519-21	RES, ADJ, CERMET 20K
RV5	1-237-519-21	RES, ADJ, CERMET 20K
RV6	1-237-518-21	RES, ADJ, CERMET 10K
RV7	1-237-518-21	RES, ADJ, CERMET 10K
RV10	1-237-519-21	RES, ADJ, CERMET 20K
RV11	1-237-519-21	RES, ADJ, CERMET 20K
RV12	1-237-519-21	RES, ADJ, CERMET 20K
RV13	1-237-519-21	RES, ADJ, CERMET 20K
RV14	1-237-519-21	RES, ADJ, CERMET 20K
RV15	1-237-519-21	RES, ADJ, CERMET 20K
RV16	1-237-519-21	RES, ADJ, CERMET 20K
RV17	1-237-517-21	RES, ADJ, CERMET 5K
RV18	1-237-517-21	RES, ADJ, CERMET 5K
RV19	1-237-519-21	RES, ADJ, CERMET 20K
RV20	1-237-519-21	RES, ADJ, CERMET 20K
RV21	1-237-519-21	RES, ADJ, CERMET 20K
RV22	1-237-516-21	RES, ADJ, CERMET 2K
RV23	1-237-516-21	RES, ADJ, CERMET 2K
RV24	1-237-516-21	RES, ADJ, CERMET 2K
RV25	1-237-519-21	RES, ADJ, CERMET 20K
RV26	1-237-519-21	RES, ADJ, CERMET 20K
RV27	1-237-519-21	RES, ADJ, CERMET 20K
RV28	1-237-519-21	RES, ADJ, CERMET 20K
RV29	1-237-519-21	RES, ADJ, CERMET 20K
RV30	1-237-519-21	RES, ADJ, CERMET 20K

REF.NO.	PART NO.	DESCRIPTION				REMARK
RV31	1-237-519-21	RES, ADJ, CERMET 20K				
RV32	1-237-516-21	RES, ADJ, CERMET 2K				

<SWITCH>

S1	1-571-908-11	SWITCH, SLIDE

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*A-1346-029-A EA BOARD, COMPLETE
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*4-347-706-00 HEAT SINK (TR)
*4-373-965-01 INSULATOR (SMALL)

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-101-810-00	CERAMIC	100PF	5%	500V	
C2	1-124-917-11	ELECT	33MF	20%	25V	
C3	1-124-357-11	ELECT	33MF	20%	35V	
C4	1-124-046-00	ELECT	10MF		160V	
C5	1-124-046-00	ELECT	10MF		160V	
C6	1-101-361-00	CERAMIC	150PF	5%	50V	
C7	1-124-046-00	ELECT	10MF		160V	
C8	1-136-337-11	FILM	3.3MF	10%	100V	
C12	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C13	1-136-165-00	FILM	0.1MF	5%	50V	
C14	1-130-728-00	FILM	0.0022MF	5%	50V	
C15	1-102-973-00	CERAMIC	100PF	5%	50V	
C16	1-124-915-11	ELECT	10MF	20%	25V	
C17	1-126-233-11	ELECT	22MF	20%	16V	
C18	1-102-973-00	CERAMIC	100PF	5%	50V	
C19	1-124-910-11	ELECT	47MF	20%	25V	
C20	1-136-161-00	FILM	0.047MF	5%	50V	
C21	1-101-810-00	CERAMIC	100PF	5%	500V	
C22	1-108-700-11	MYLAR	0.047MF	10%	200V	
C23	1-123-024-21	ELECT	33MF		160V	
C24	1-124-046-00	ELECT	10MF		160V	
C25	1-136-541-11	FILM	1.5MF	5%	200V	
C26	1-136-161-00	FILM	0.047MF	5%	50V	
C27	1-108-700-11	MYLAR	0.047MF	10%	200V	
C28	1-124-666-11	ELECT	4.7MF	20%	200V	
C29	1-101-810-00	CERAMIC	100PF	5%	500V	
C30	1-162-135-11	CERAMIC	560PF	10%	2KV	
C31	1-136-069-00	FILM	0.0044MF	3%	2KV	
C32	1-136-069-00	FILM	0.0044MF	3%	2KV	
C33	1-124-512-11	ELECT	33MF	20%	50V	
C34	1-124-512-11	ELECT	33MF	20%	50V	
C35	1-126-163-11	ELECT	4.7MF	20%	50V	
C36	1-126-163-11	ELECT	4.7MF	20%	50V	
C37	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C39	1-162-318-11	CERAMIC	0.001MF	10%	500V	
C40	1-124-915-11	ELECT	10MF	20%	16V	
C41	1-102-244-00	CERAMIC	220PF	10%	500V	
C42	1-102-973-00	CERAMIC	100PF	5%	50V	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-110-31	DIODE RD12ESB2
D2	8-719-911-19	DIODE 1SS119
D3	8-719-911-19	DIODE 1SS119
D4	8-719-911-19	DIODE 1SS119
D7	8-719-110-03	DIODE RD7.5ESB2
D8	8-719-300-76	DIODE RH-1A
D9	8-719-928-08	DIODE ERD28-08S

REF.NO.	PART NO.	DESCRIPTION				REMARK
D10	8-719-300-76	DIODE RH-1A				
D11	8-719-300-76	DIODE RH-1A				
D12	8-719-300-76	DIODE RH-1A				
D13	8-719-109-75	DIODE RD4.3ESB2				
D14	8-719-109-75	DIODE RD4.3ESB2				
D15	8-719-911-19	DIODE ISS119				
D16	8-719-911-19	DIODE ISS119				

\<CONNECTOR\>

REF.NO.	PART NO.	DESCRIPTION
EA1	*1-568-536-11	PLUG (MINIATURE DY) 6P

\<IC\>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-100-75	IC UPC1394C
IC2	8-759-145-58	IC UPC4558C

\<COIL\>

REF.NO.	PART NO.	DESCRIPTION
L1	1-459-433-00	COIL (WITH CORE)
L2	1-459-433-00	COIL (WITH CORE)
L3	1-459-433-00	COIL (WITH CORE)
L4	1-459-111-00	COIL, DRAM CORE (CDI)
L5	1-459-111-00	COIL, DRAM CORE (CDI)

\<TRANSISTOR\>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q2	8-729-697-92	TRANSISTOR 2SA979-G
Q3	8-729-140-50	TRANSISTOR 2SC3209LK
Q4	8-729-303-61	TRANSISTOR 2SC3851-G
Q5	8-729-304-07	TRANSISTOR 2SA1488-Y
Q10	8-729-119-80	TRANSISTOR 2SC2688-LK
Q11	8-729-175-22	TRANSISTOR 2SC2752-L
Q12	8-729-200-17	TRANSISTOR 2SA1091-O
Q13	8-729-119-80	TRANSISTOR 2SC2688-LK
Q14	8-729-202-53	TRANSISTOR 2SD1556-LB
Q15	8-729-313-42	TRANSISTOR 2SD1134-C
Q16	8-729-385-82	TRANSISTOR 2SB858-C

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-249-418-11	CARBON	1.2K	5%	1/4W	
R2	1-249-425-11	CARBON	4.7K	5%	1/4W	
R3	1-249-429-11	CARBON	10K	5%	1/4W	
R4	1-249-429-11	CARBON	10K	5%	1/4W	
R5	1-249-429-11	CARBON	10K	5%	1/4W	
R6	1-249-429-11	CARBON	10K	5%	1/4W	
R7	1-249-421-11	CARBON	2.2K	5%	1/4W	
R8	1-249-438-11	CARBON	56K	5%	1/4W	
R9	1-249-429-11	CARBON	10K	5%	1/4W	
R10	1-249-418-11	CARBON	1.2K	5%	1/4W	
R11	1-249-448-11	CARBON	1.2	5%	1/4W	F
R12	1-249-448-11	CARBON	1.2	5%	1/4W	F
R13	1-249-417-11	CARBON	1K	5%	1/4W	
R14	1-215-887-00	METAL OXIDE	150	5%	2W	F
R15	1-249-429-11	CARBON	10K	5%	1/4W	
R22	1-249-417-11	CARBON	1K	5%	1/4W	
R23	1-215-445-00	METAL	10K	1%	1/4W	
R24	1-215-445-00	METAL	10K	1%	1/4W	
R25	1-215-431-00	METAL	2.7K	1%	1/4W	
R26	1-215-431-00	METAL	2.7K	1%	1/4W	
R27	1-249-435-11	CARBON	33K	5%	1/4W	
R28	1-215-461-00	METAL	47K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R29	1-249-429-11	CARBON	10K	5%	1/4W	
R30	1-249-429-11	CARBON	10K	5%	1/4W	
R31	1-247-868-11	CARBON	36K	5%	1/4W	
R32	1-249-429-11	CARBON	10K	5%	1/4W	
R33	1-249-427-11	CARBON	6.8K	5%	1/4W	
R34	1-215-433-00	METAL	3.3K	1%	1/4W	
R35	1-215-435-00	METAL	3.9K	1%	1/4W	
R36	1-249-429-11	CARBON	10K	5%	1/4W	
R37	1-249-441-11	CARBON	100K	5%	1/4W	
R38	1-249-429-11	CARBON	10K	5%	1/4W	
R39	1-215-469-00	METAL	100K	1%	1/4W	
R40	1-249-429-11	CARBON	10K	5%	1/4W	
R41	1-249-429-11	CARBON	10K	5%	1/4W	
R42	1-215-876-00	METAL OXIDE	15K	5%	1W	F
R43	1-215-859-00	METAL OXIDE	22	5%	1W	F
R44	1-216-349-00	METAL OXIDE	1	5%	1W	F
R45	1-249-417-11	CARBON	1K	5%	1/4W	
R46	1-249-417-11	CARBON	1K	5%	1/4W	
R47	1-216-463-00	METAL OXIDE	12K	5%	2W	F
R48	1-216-346-00	METAL OXIDE	0.56	5%	1W	F
R49	1-249-382-11	CARBON	1.2	5%	1/4W	F
R50	1-247-826-00	CARBON	620	5%	1/4W	
R51	1-247-826-00	CARBON	620	5%	1/4W	
R52	1-215-445-00	METAL	10K	1%	1/4W	
R53	1-215-445-00	METAL	10K	1%	1/4W	
R54	1-215-447-00	METAL	12K	1%	1/4W	
R55	1-249-391-11	CARBON	6.8	5%	1/4W	F
R56	1-215-445-00	METAL	10K	1%	1/4W	
R57	1-215-445-00	METAL	10K	1%	1/4W	
R58	1-249-405-11	CARBON	100	5%	1/4W	
R59	1-249-419-11	CARBON	1.5K	5%	1/4W	
R60	1-249-419-11	CARBON	1.5K	5%	1/4W	
R61	1-215-882-00	METAL OXIDE	22	5%	2W	F
R62	1-215-882-00	METAL OXIDE	22	5%	2W	F
R63	1-216-361-00	METAL OXIDE	0.22	5%	2W	F

\<TRANSFORMER\>

REF.NO.	PART NO.	DESCRIPTION
T1	1-460-067-11	HLT
T2	1-407-850-00	DLT
T3	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T4	1-437-079-00	TRANSFORMER, HORIZONTAL DRIVE
T5	1-439-383-11	HOT

****

*1-627-678-11 W BOARD
****

\<CAPACITOR\>

REF.NO.	PART NO.	DESCRIPTION			
C1	1-108-692-11	MYLAR	0.01MF	10%	200V
C2	1-108-692-11	MYLAR	0.01MF	10%	200V

\<RESISTOR\>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-214-702-00	METAL	75	1%	1/4W
R2	1-214-702-00	METAL	75	1%	1/4W
R3	1-214-702-00	METAL	75	1%	1/4W

REF.NO.	PART NO.	DESCRIPTION	REMARK
	**		
	*1-647-257-11	HW BOARD	
		********	
		<HOLDER>	
D1	*4-026-910-00	HOLDER, LED	
D2	*4-026-910-00	HOLDER, LED	
		<DIODE>	
D101	8-719-938-68	DIODE GL3HY8	
D102	8-719-812-41	DIODE TLR124	
		<RESISTOR>	
R101	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
		<SWITCH>	
S101	1-570-566-11	SWITCH, PUSH (4 KEY)	
S102	1-570-566-11	SWITCH, PUSH (4 KEY)	
S103	1-570-566-11	SWITCH, PUSH (4 KEY)	
S104	1-570-566-11	SWITCH, PUSH (4 KEY)	
	**		
	*1-627-682-11	HH BOARD	
		********	
	*1-566-614-11	PLUG (L TYPE) 3P	
		<VARIABLE RESISTOR>	
RV1	1-238-332-11	RES, VAR, CARBON 20K	
RV2	1-238-332-11	RES, VAR, CARBON 20K	
RV3	1-238-332-11	RES, VAR, CARBON 20K	
RV4	1-238-332-11	RES, VAR, CARBON 20K	
	**		
	*1-647-258-11	HX BOARD	
		********	
		<SWITCH>	
S1	1-692-470-11	SWITCH, PUSH (4 KEY)	
	**		
	A-1371-895-A	HY BOARD, COMPLETE	
		******************	
		<CAPACITOR>	
C1	1-124-584-00	ELECT 100MF 20% 10V	
C2	1-124-584-00	ELECT 100MF 20% 10V	
C3	1-124-584-00	ELECT 100MF 20% 10V	
C4	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C5	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C6	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
		<DIODE>	
D1	8-719-404-46	DIODE MA110	
D2	8-719-404-46	DIODE MA110	
D3	8-719-404-46	DIODE MA110	
D4	8-719-404-46	DIODE MA110	
D5	8-719-404-46	DIODE MA110	

REF.NO.	PART NO.	DESCRIPTION	REMARK
D6	8-719-404-46	DIODE MA110	
D7	8-719-404-46	DIODE MA110	
D8	8-719-404-46	DIODE MA110	
D9	8-719-404-46	DIODE MA110	
D10	8-719-404-46	DIODE MA110	
D11	8-719-404-46	DIODE MA110	
D12	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D12	
D13	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D13	
D14	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D14	
D15	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D15	
D16	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D16	
D17	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D17	
D18	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D18	
D19	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D19	
D20	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D20	
D21	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D21	
D22	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D22	
D23	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER; LED; D23	
D24	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D24	
D25	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D25	
D26	8-719-404-46	DIODE MA110	
D27	8-719-404-46	DIODE MA110	
D28	8-719-404-46	DIODE MA110	
D29	8-719-404-46	DIODE MA110	
D30	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D30	
D31	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D31	
D32	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D32	
D33	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D33	
D34	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D34	
D35	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D35	
D36	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D36	
D37	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D37	
D38	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D38	
D39	8-719-404-46	DIODE MA110	
D40	8-719-404-46	DIODE MA110	
D41	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D41	
D42	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D42	
D43	8-719-938-68	DIODE GL3HY8	
	*4-374-937-01	HOLDER, LED; D43	
D44	8-719-938-68	DIODE GL3HY8	

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION			REMARK
	*4-374-937-01	HOLDER, LED; D44			
D45	8-719-404-46	DIODE MA110			
D46	8-719-404-46	DIODE MA110			
D47	8-719-404-46	DIODE MA110			
D48	8-719-404-46	DIODE MA110			
D49	8-719-404-46	DIODE MA110			
D50	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D50			
D51	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D51			
D52	8-719-404-46	DIODE MA110			
D53	8-719-404-46	DIODE MA110			
D54	8-719-404-46	DIODE MA110			
D55	8-719-404-46	DIODE MA110			
D56	8-719-404-46	DIODE MA110			
D57	8-719-404-46	DIODE MA110			
D58	8-719-404-46	DIODE MA110			
D59	8-719-404-46	DIODE MA110			
D60	8-719-404-46	DIODE MA110			
D61	8-719-404-46	DIODE MA110			
D62	8-719-404-46	DIODE MA110			
D63	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D63			
D64	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D64			
D65	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D65			
D66	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D66			
D67	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D67			
D68	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D68			
D69	8-719-938-68	DIODE GL3HY8			
	*4-374-937-01	HOLDER, LED; D69			

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION
HY1	*1-566-045-11	PIN, CONNECTOR 6P
HY2	*1-566-047-11	PIN, CONNECTOR 8P
HY3	*1-566-052-11	PIN, CONNECTOR 13P
HY4	*1-566-047-11	PIN, CONNECTOR 8P

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-757-991-00	IC CX-7991
IC2	8-757-991-00	IC CX-7991
IC3	8-757-991-00	IC CX-7991

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
JR1	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR2	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR3	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR4	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR5	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR6	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR7	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR8	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR9	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR10	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR11	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR12	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR13	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR14	1-216-295-00	METAL GLAZE	0	5%	1/10W

REF.NO.	PART NO.	DESCRIPTION			REMARK
JR15	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR16	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR17	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR18	1-216-295-00	METAL GLAZE	0	5%	1/10W

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-175-72	TRANSISTOR 2SC2757-T33

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
R1	1-216-043-00	METAL GLAZE	560	5%	1/10W
R2	1-216-043-00	METAL GLAZE	560	5%	1/10W
R3	1-216-043-00	METAL GLAZE	560	5%	1/10W
R4	1-216-043-00	METAL GLAZE	560	5%	1/10W
R5	1-216-043-00	METAL GLAZE	560	5%	1/10W
R6	1-216-043-00	METAL GLAZE	560	5%	1/10W
R7	1-216-043-00	METAL GLAZE	560	5%	1/10W
R8	1-216-043-00	METAL GLAZE	560	5%	1/10W
R9	1-216-043-00	METAL GLAZE	560	5%	1/10W
R10	1-216-043-00	METAL GLAZE	560	5%	1/10W
R11	1-216-043-00	METAL GLAZE	560	5%	1/10W
R12	1-216-043-00	METAL GLAZE	560	5%	1/10W
R13	1-216-043-00	METAL GLAZE	560	5%	1/10W
R14	1-216-043-00	METAL GLAZE	560	5%	1/10W
R15	1-216-043-00	METAL GLAZE	560	5%	1/10W
R16	1-216-043-00	METAL GLAZE	560	5%	1/10W
R17	1-216-043-00	METAL GLAZE	560	5%	1/10W
R18	1-216-043-00	METAL GLAZE	560	5%	1/10W
R19	1-216-045-00	METAL GLAZE	680	5%	1/10W
R20	1-216-033-00	METAL GLAZE	220	5%	1/10W
R21	1-216-043-00	METAL GLAZE	560	5%	1/10W
R22	1-216-033-00	METAL GLAZE	220	5%	1/10W
R23	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R24	1-216-043-00	METAL GLAZE	560	5%	1/10W
R25	1-216-043-00	METAL GLAZE	560	5%	1/10W
R26	1-216-043-00	METAL GLAZE	560	5%	1/10W
R27	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R28	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R29	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R30	1-216-043-00	METAL GLAZE	560	5%	1/10W
R31	1-216-043-00	METAL GLAZE	560	5%	1/10W
R32	1-216-043-00	METAL GLAZE	560	5%	1/10W
R33	1-216-043-00	METAL GLAZE	560	5%	1/10W
R34	1-216-043-00	METAL GLAZE	560	5%	1/10W
R35	1-216-043-00	METAL GLAZE	560	5%	1/10W
R36	1-216-043-00	METAL GLAZE	560	5%	1/10W
R37	1-216-043-00	METAL GLAZE	560	5%	1/10W
R38	1-216-043-00	METAL GLAZE	560	5%	1/10W
R39	1-216-043-00	METAL GLAZE	560	5%	1/10W
R40	1-216-043-00	METAL GLAZE	560	5%	1/10W
R41	1-216-043-00	METAL GLAZE	560	5%	1/10W
R42	1-216-043-00	METAL GLAZE	560	5%	1/10W
R43	1-216-043-00	METAL GLAZE	560	5%	1/10W

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION
S1	1-572-482-11	SWITCH, KEY BOARD (1 KEY)
S2	1-572-482-11	SWITCH, KEY BOARD (1 KEY)
S3	1-572-482-11	SWITCH, KEY BOARD (1 KEY)
S4	1-572-482-11	SWITCH, KEY BOARD (1 KEY)
S5	1-572-482-11	SWITCH, KEY BOARD (1 KEY)
S6	1-572-482-11	SWITCH, KEY BOARD (1 KEY)

REF.NO.	PART NO.	DESCRIPTION		REMARK	REF.NO.	PART NO.	DESCRIPTION			REMARK
S7	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C63	1-126-769-21	ELECT CHIP	100MF	20%	14V
S8	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C64	1-126-769-21	ELECT CHIP	100MF	20%	14V
S9	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C65	1-126-769-21	ELECT CHIP	100MF	20%	14V
S10	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C66	1-126-769-21	ELECT CHIP	100MF	20%	14V
S11	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C67	1-126-769-21	ELECT CHIP	100MF	20%	14V
S12	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C68	1-126-769-21	ELECT CHIP	100MF	20%	14V
S13	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C81	1-126-769-21	ELECT CHIP	100MF	20%	14V
S14	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C91	1-126-769-21	ELECT CHIP	100MF	20%	14V
S15	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C92	1-126-769-21	ELECT CHIP	100MF	20%	14V
S16	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C101	1-126-769-21	ELECT CHIP	100MF	20%	14V
S17	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C102	1-126-769-21	ELECT CHIP	100MF	20%	14V
S18	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C111	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S19	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C112	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S20	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C121	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S21	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C122	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S22	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C123	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S23	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C124	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S24	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C125	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S25	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C126	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S26	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C127	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S27	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C128	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S28	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C141	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S29	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C142	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S30	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C143	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S31	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C144	1-163-031-11	CERAMIC CHIP 0.01MF			50V
S32	1-572-482-11	SWITCH, KEY BOARD (1 KEY)			C145	1-163-031-11	CERAMIC CHIP 0.01MF			50V
					C146	1-163-031-11	CERAMIC CHIP 0.01MF			50V
					C147	1-163-031-11	CERAMIC CHIP 0.01MF			50V
					C148	1-163-031-11	CERAMIC CHIP 0.01MF			50V
					C149	1-163-031-11	CERAMIC CHIP 0.01MF			50V

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A-1371-896-A HZ BOARD; COMPLETE
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<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK	REF.NO.	PART NO.	DESCRIPTION		REMARK
C1	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C161	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C2	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C162	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C3	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C163	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C4	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C164	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C5	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C165	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C6	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C166	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C7	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C167	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C8	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C168	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C9	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C169	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C10	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C170	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C11	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C171	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C12	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C172	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C13	1-163-227-11	CERAMIC CHIP 10PF	0.5PF		50V	C173	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C14	1-163-239-11	CERAMIC CHIP 33PF	5%		50V	C174	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C15	1-163-097-00	CERAMIC CHIP 15PF	5%		50V	C175	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C16	1-163-031-11	CERAMIC CHIP 0.01MF			50V	C176	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C17	1-163-097-00	CERAMIC CHIP 15PF	5%		50V	C177	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C18	1-163-097-00	CERAMIC CHIP 15PF	5%		50V	C178	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C19	1-124-779-00	ELECT CHIP 10MF	20%		16V	C179	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C21	1-126-103-11	ELECT 470MF	20%		16V	C181	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C22	1-126-103-11	ELECT 470MF	20%		16V	C182	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C23	1-126-204-11	ELECT CHIP 47MF	20%		16V	C183	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C24	1-126-204-11	ELECT CHIP 47MF	20%		16V	C191	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C41	1-126-103-11	ELECT 470MF	20%		16V	C192	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C42	1-126-103-11	ELECT 470MF	20%		16V					
C43	1-126-204-11	ELECT CHIP 47MF	20%		16V			<DIODE>		
C44	1-126-204-11	ELECT CHIP 47MF	20%		16V					
C45	1-126-204-11	ELECT CHIP 47MF	20%		16V	D1	8-719-109-88	DIODE RD5.6ESB1		
C61	1-126-103-11	ELECT 470MF	20%		16V	D2	8-719-109-88	DIODE RD5.6ESB1		
C62	1-126-769-21	ELECT CHIP 100MF	20%		14V	D3	8-719-109-88	DIODE RD5.6ESB1		
						D4	8-719-109-88	DIODE RD5.6ESB1		
						D5	8-719-109-88	DIODE RD5.6ESB1		
						D6	8-719-109-88	DIODE RD5.6ESB1		
						D7	8-719-109-88	DIODE RD5.6ESB1		

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REMARK
D8	8-719-109-88	DIODE RD5.6ESB1	
D9	8-719-109-88	DIODE RD5.6ESB1	
D10	8-719-109-88	DIODE RD5.6ESB1	
D11	8-719-109-88	DIODE RD5.6ESB1	
D12	8-719-109-88	DIODE RD5.6ESB1	
D13	8-719-109-88	DIODE RD5.6ESB1	
D14	8-719-109-88	DIODE RD5.6ESB1	
D15	8-719-109-88	DIODE RD5.6ESB1	
D17	8-719-104-34	DIODE 1S2836	
D18	8-719-400-18	DIODE MA152WK	
D19	8-719-400-18	DIODE MA152WK	
D21	8-719-106-23	DIODE RD7.5M-B2	
D22	8-719-106-23	DIODE RD7.5M-B2	

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION	
HZ1	*1-566-064-11	PIN, CONNECTOR	12P
HZ2	*1-566-062-11	PIN, CONNECTOR	10P
HZ3	*1-566-060-11	PIN, CONNECTOR	8P
HZ4	*1-566-064-11	PIN, CONNECTOR	12P
HZ5	*1-566-058-11	PIN, CONNECTOR	6P
HZ6	*1-566-064-11	PIN, CONNECTOR	12P
HZ7	*1-566-064-11	PIN, CONNECTOR	12P
HZ8	*1-566-064-11	PIN, CONNECTOR	12P
HZ9	*1-566-058-11	PIN, CONNECTOR	6P
HZ10	*1-566-062-11	PIN, CONNECTOR	10P
HZ11	*1-566-062-11	PIN, CONNECTOR	10P
HZ12A	*1-566-065-11	PIN, CONNECTOR	13P
HZ12B	*1-566-065-11	PIN, CONNECTOR	13P

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-939-25	IC SN75176BP
IC2	8-759-939-25	IC SN75176BP
IC3	8-759-164-54	IC X25040
IC4	8-759-995-76	IC PST529C
IC5	8-759-981-48	IC TL082M
IC6	8-759-112-72	IC UPD6142G-101
IC7	8-759-239-88	IC TC74HCT02AF
IC8	8-759-240-03	IC TC74HCT32AF
IC9	8-759-233-66	IC TC74HCT04AF
IC10	8-759-981-48	IC TL082M
IC11	8-759-240-65	IC TC74HCT139AF
IC12	8-759-009-05	IC MC14051BF
IC13	8-759-938-68	IC CXD1095Q
IC14	8-759-981-48	IC TL082M
IC15	8-759-238-69	IC TC74HC299AF-TP1
IC16	8-759-009-05	IC MC14051BF
IC17	8-759-239-88	IC TC74HCT02AF
IC18	8-759-981-48	IC TL082M
IC19	8-759-981-48	IC TL082M
IC20	8-759-518-73	IC DAC8043GP
IC21	8-759-518-76	IC REF02EZ
IC22	8-759-981-48	IC TL082M
IC23	8-759-981-48	IC TL082M
IC24	8-759-164-55	IC HD6475368CP-BVM

<IC SOCKET>

REF.NO.	PART NO.	DESCRIPTION
ICS3	1-526-652-21	SOCKET, IC (DP) 8P
ICS24	1-540-069-11	SOCKET, IC (IC113) 84P

<COIL>

REF.NO.	PART NO.	DESCRIPTION		REMARK
L1	1-408-409-00	INDUCTOR	10UH	
L2	1-408-409-00	INDUCTOR	10UH	
L3	1-410-211-51	INDUCTOR CHIP	39UH	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q2	8-729-901-01	TRANSISTOR DTC144EK
Q3	8-729-901-01	TRANSISTOR DTC144EK
Q4	8-729-901-01	TRANSISTOR DTC144EK
Q5	8-729-901-01	TRANSISTOR DTC144EK
Q6	8-729-901-01	TRANSISTOR DTC144EK
Q7	8-729-901-01	TRANSISTOR DTC144EK
Q8	8-729-901-01	TRANSISTOR DTC144EK
Q9	8-729-901-01	TRANSISTOR DTC144EK
Q10	8-729-901-01	TRANSISTOR DTC144EK
Q11	8-729-901-01	TRANSISTOR DTC144EK
Q12	8-729-901-01	TRANSISTOR DTC144EK
Q13	8-729-901-01	TRANSISTOR DTC144EK
Q14	8-729-901-01	TRANSISTOR DTC144EK
Q15	8-729-901-01	TRANSISTOR DTC144EK
Q16	8-729-901-01	TRANSISTOR DTC144EK
Q17	8-729-901-01	TRANSISTOR DTC144EK
Q18	8-729-901-01	TRANSISTOR DTC144EK
Q19	8-729-122-63	TRANSISTOR 2SA1226-E4
Q20	8-729-901-01	TRANSISTOR DTC144EK
Q21	8-729-901-01	TRANSISTOR DTC144EK
Q22	8-729-901-01	TRANSISTOR DTC144EK
Q23	8-729-901-01	TRANSISTOR DTC144EK
Q24	8-729-901-01	TRANSISTOR DTC144EK
Q25	8-729-901-01	TRANSISTOR DTC144EK
Q26	8-729-901-01	TRANSISTOR DTC144EK
Q27	8-729-901-01	TRANSISTOR DTC144EK
Q28	8-729-901-06	TRANSISTOR DTA144EK
Q29	8-729-901-01	TRANSISTOR DTC144EK
Q30	8-729-122-63	TRANSISTOR 2SA1226-E4
Q900	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q901	8-729-120-28	TRANSISTOR 2SC1623-L5L6
Q902	8-729-901-01	TRANSISTOR DTC144EK
Q903	8-729-901-01	TRANSISTOR DTC144EK

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
JR1	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR2	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR3	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR4	1-216-295-00	METAL GLAZE	0	5%	1/10W
R1	1-216-091-00	METAL GLAZE	56K	5%	1/10W
R2	1-216-091-00	METAL GLAZE	56K	5%	1/10W
R3	1-249-417-11	CARBON	1K	5%	1/4W
R4	1-216-025-00	METAL GLAZE	100	5%	1/10W
R5	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R6	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7	1-249-417-11	CARBON	1K	5%	1/4W
R8	1-216-091-00	METAL GLAZE	56K	5%	1/10W
R9	1-249-417-11	CARBON	1K	5%	1/4W
R10	1-216-090-00	METAL GLAZE	51K	5%	1/10W
R11	1-216-080-00	METAL GLAZE	20K	5%	1/10W
R12	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R13	1-216-091-00	METAL GLAZE	56K	5%	1/10W
R14	1-249-417-11	CARBON	1K	5%	1/4W
R15	1-216-091-00	METAL GLAZE	56K	5%	1/10W
R16	1-249-417-11	CARBON	1K	5%	1/4W
R17	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R18	1-216-073-00	METAL GLAZE	10K	5%	1/10W

REF.NO.	PART NO.	DESCRIPTION				REMARK
R19	1-249-422-11	CARBON	2.7K	5%	1/4W	
R20	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R21	1-249-417-11	CARBON	1K	5%	1/4W	
R22	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R23	1-249-422-11	CARBON	2.7K	5%	1/4W	
R24	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R25	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R26	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R27	1-249-422-11	CARBON	2.7K	5%	1/4W	
R28	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R29	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R30	1-249-422-11	CARBON	2.7K	5%	1/4W	
R31	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R32	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R33	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R34	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R35	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R36	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R37	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R38	1-249-417-11	CARBON	1K	5%	1/4W	
R39	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R40	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R41	1-249-417-11	CARBON	1K	5%	1/4W	
R42	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R43	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R44	1-249-417-11	CARBON	1K	5%	1/4W	
R45	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R46	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R47	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R48	1-249-417-11	CARBON	1K	5%	1/4W	
R49	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R50	1-249-417-11	CARBON	1K	5%	1/4W	
R51	1-249-417-11	CARBON	1K	5%	1/4W	
R52	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R53	1-249-417-11	CARBON	1K	5%	1/4W	
R54	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R55	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R56	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R57	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R58	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R59	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R60	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R61	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R62	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R63	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R64	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R65	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R66	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R67	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R68	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R69	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R70	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R71	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R73	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R74	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R75	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R76	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R77	1-216-074-00	METAL GLAZE	11K	5%	1/10W	
R78	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R79	1-216-080-00	METAL GLAZE	20K	5%	1/10W	
R80	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R81	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R82	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R83	1-216-073-00	METAL GLAZE	10K	5%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R84	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R85	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R86	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R87	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R88	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R89	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R90	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R91	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R92	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R93	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R94	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R95	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R97	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R100	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R101	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R102	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R103	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R104	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R105	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R106	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R107	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R181	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R191	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R208	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R209	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	

\<SWITCH\>

S1	1-572-482-11	SWITCH, KEY BOARD (1 KEY)
S2	1-572-482-11	SWITCH, KEY BOARD (1 KEY)

\<CRYSTAL\>

X1	1-577-121-11	VIBRATOR, CRYSTAL

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    *1-617-890-11 HA BOARD
        ****

\<CONNECTOR\>

HA1	*1-566-055-11	PIN, CONNECTOR 3P
HA2	*1-566-056-11	PIN, CONNECTOR 4P
HA3	*1-566-064-11	PIN, CONNECTOR 12P
HA4	*1-566-054-11	PIN, CONNECTOR 2P

\<RESISTOR\>

R1	1-247-814-11	CARBON	200	5%	1/4W
R2	1-215-469-00	METAL	100K	1%	1/4W

\<VARIABLE RESISTOR\>

RV1	1-237-519-21	RES, ADJ, CERMET 20K

\<SWITCH\>

S1	1-570-565-11	SWITCH, PUSH (10 KEY)
S2	1-570-565-11	SWITCH, PUSH (10 KEY)
S3	1-570-565-11	SWITCH, PUSH (10 KEY)
S4	1-570-565-11	SWITCH, PUSH (10 KEY)
S5	1-570-565-11	SWITCH, PUSH (10 KEY)
S6	1-570-565-11	SWITCH, PUSH (10 KEY)

7. ELECTRICAL PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK

Left column:

S7	1-570-565-11	SWITCH, PUSH (10 KEY)
S8	1-570-565-11	SWITCH, PUSH (10 KEY)
S9	1-570-565-11	SWITCH, PUSH (10 KEY)
S10	1-570-565-11	SWITCH, PUSH (10 KEY)

****

*1-617-893-11 Y BOARD
****

<DIODE>

D1	8-719-812-43	DIODE TLG124A

****

*A-1390-344-A TB BOARD, COMPLETE
****

<CONNECTOR>

CN1	*1-564-431-11	POST, CONNECTOR 3P
CN2	*1-564-431-11	POST, CONNECTOR 3P
CN11	*1-561-724-00	SOCKET, CONNECTOR 2P
CN12	*1-561-724-00	SOCKET, CONNECTOR 2P

<RESISTOR>

R100	1-249-422-11	CARBON	2.7K	5%	1/4W

<CONNECTOR>

TB4	*1-566-054-11	PIN, CONNECTOR 2P
TB5	*1-566-054-11	PIN, CONNECTOR 2P
TB6	*1-566-060-11	PIN, CONNECTOR 8P
TB7	*1-566-054-11	PIN, CONNECTOR 2P
TB8	*1-566-058-11	PIN, CONNECTOR 6P
TB9	*1-566-060-11	PIN, CONNECTOR 8P
TB10	*1-566-064-11	PIN, CONNECTOR 12P
TB11	*1-566-055-11	PIN, CONNECTOR 3P
TB12	*1-566-064-11	PIN, CONNECTOR 12P
TB13	*1-566-062-11	PIN, CONNECTOR 10P
TB14	*1-566-064-11	PIN, CONNECTOR 12P
TB15	*1-566-060-11	PIN, CONNECTOR 8P
TB16	*1-566-057-11	PIN, CONNECTOR 5P
TB17	*1-566-057-11	PIN, CONNECTOR 5P
TB18	*1-566-055-11	PIN, CONNECTOR 3P
TB19	*1-566-056-11	PIN, CONNECTOR 4P
TB20	*1-566-056-11	PIN, CONNECTOR 4P
TB21	*1-566-056-11	PIN, CONNECTOR 4P
TB22	*1-566-054-11	PIN, CONNECTOR 2P
TB23	*1-566-054-11	PIN, CONNECTOR 2P
TB24	*1-566-054-11	PIN, CONNECTOR 2P
TB28	*1-566-062-11	PIN, CONNECTOR 10P
TB29	*1-566-060-11	PIN, CONNECTOR 8P
TB31	*1-561-337-00	CONNECTOR, MULTI
TB32	*1-561-337-00	CONNECTOR, MULTI
TB33	*1-561-337-00	CONNECTOR, MULTI
TB34	*1-561-337-00	CONNECTOR, MULTI
TB35	*1-561-337-00	CONNECTOR, MULTI
TB36	*1-561-337-00	CONNECTOR, MULTI
TB37	*1-561-337-00	CONNECTOR, MULTI
TB38	*1-561-337-00	CONNECTOR, MULTI
TB39	*1-561-337-00	CONNECTOR, MULTI
TB40	*1-561-337-00	CONNECTOR, MULTI

Right column:

****

*1-647-911-11 TA BOARD
****

<CONNECTOR>

TA1	*1-566-054-11	PIN, CONNECTOR 2P
TA2	*1-566-055-11	PIN, CONNECTOR 3P
TA3	*1-566-056-11	PIN, CONNECTOR 4P
TA4	*1-566-057-11	PIN, CONNECTOR 5P
TA5	*1-566-058-11	PIN, CONNECTOR 6P
TA6	*1-566-055-11	PIN, CONNECTOR 3P
TA7	*1-566-058-11	PIN, CONNECTOR 6P
TA8	*1-566-042-11	PIN, CONNECTOR 3P
TA9	*1-566-045-11	PIN, CONNECTOR 6P
TA10	*1-566-045-11	PIN, CONNECTOR 6P
TA11	*1-566-045-11	PIN, CONNECTOR 6P
TA12	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P
TA13	*1-561-337-00	CONNECTOR, MULTI
TA14	*1-561-337-00	CONNECTOR, MULTI
TA15	*1-561-337-00	CONNECTOR, MULTI

****

*A-1394-088-A Z BOARD, COMPLETE
****

*1-561-337-21 CONNECTOR, MULTI

****

*A-1394-128-A PA BOARD, COMPLETE
****

<CAPACITOR>

C101	1-124-046-00	ELECT	10MF	20%	160V
C102	1-124-910-11	ELECT	47MF	20%	25V
C103	1-123-024-21	ELECT	33MF		160V
C104	1-136-171-00	FILM	0.33MF	5%	50V
C105	1-108-700-11	MYLAR	0.047MF	10%	200V
C106	1-108-700-11	MYLAR	0.047MF	10%	200V
C107	1-102-030-00	CERAMIC	330PF	10%	500V
C108	1-136-072-00	FILM	0.0063MF	3%	2KV
C109	1-161-753-00	CERAMIC	470PF	10%	3KV
C110	1-162-114-00	CERAMIC	0.0047MF		2KV
C111	1-136-601-11	FILM	0.01MF	10%	630V
C112	1-136-557-11	FILM	0.0033MF	5%	630V
C113	1-136-173-00	FILM	0.47MF	5%	50V
C116	1-126-233-11	ELECT	22MF	20%	16V
C117	1-124-910-11	ELECT	47MF	20%	16V
C118	1-102-973-00	CERAMIC	100PF	5%	50V
C119	1-108-796-11	MYLAR	0.0022MF	5%	50V
C120	1-124-915-11	ELECT	10MF	20%	16V
C121	1-102-074-00	CERAMIC	0.001MF	10%	50V
C122	1-136-165-00	FILM	0.1MF	5%	50V
C123	1-136-169-00	FILM	0.22MF	5%	50V
C124	1-136-111-00	FILM	1MF	5%	200V
C125	1-136-169-00	FILM	0.22MF	5%	50V
C126	1-102-030-00	CERAMIC	330PF	10%	500V
C127	1-130-736-11	FILM	0.01MF	5%	50V
C128	1-130-994-11	FILM	0.033MF	5%	50V
C129	1-123-369-00	ELECT	4.7MF	20%	25V
C130	1-102-074-00	CERAMIC	0.001MF	10%	50V
C131	1-136-153-00	FILM	0.01MF	5%	50V
C132	1-101-004-00	CERAMIC	0.01MF		50V

7. ELECTRICAL PARTS LIST

PA

- The components identified by ▨ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION				REMARK
C201	1-108-634-11	MYLAR	0.047MF	10%	100V	
C202	1-124-915-11	ELECT	10MF	20%	16V	
C203	1-101-006-00	CERAMIC	0.047MF		50V	
C204	1-124-122-11	ELECT	100MF	20%	25V	
C205	1-126-541-11	ELECT	330MF	20%	16V	
C207	1-124-122-11	ELECT	100MF	20%	25V	
C209	1-101-006-00	CERAMIC	0.047MF		50V	
C212	1-101-006-00	CERAMIC	0.047MF		50V	
C213	1-124-915-11	ELECT	10MF	20%	50V	
C214	1-124-915-11	ELECT	10MF	20%	50V	
C215	1-124-915-11	ELECT	10MF	20%	16V	
C216	1-136-153-00	FILM	0.01MF	5%	50V	
C217	1-124-915-11	ELECT	10MF	20%	16V	
C218	1-126-541-11	ELECT	330MF	20%	16V	
C219	1-101-004-00	CERAMIC	0.01MF		50V	
C220	1-130-994-11	FILM	0.033MF	5%	50V	
C221	1-136-171-00	FILM	0.033MF	5%	50V	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D102	8-719-300-80	DIODE RU-1C
D103	8-719-300-80	DIODE RU-1C
D104	8-719-300-80	DIODE RU-1C
D105	8-719-300-80	DIODE RU-1C
D106	8-719-901-19	DIODE V11N
D107	8-719-109-93	DIODE RD6.2ESB2
D109	8-719-911-19	DIODE 1SS119
D110	8-719-911-19	DIODE 1SS119
D111	8-719-109-63	DIODE RD3.0ESB2
D201	8-719-911-19	DIODE 1SS119
D202	8-719-109-72	DIODE RD3.9ESB2
D203	8-719-911-19	DIODE 1SS119
D204	8-719-000-28	THYRISTOR CR02AM-8
D205	8-719-000-28	THYRISTOR CR02AM-8
D206	8-719-911-19	DIODE 1SS119
D207	8-719-911-19	DIODE 1SS119
D215⚠	8-759-107-91	IC UPC574J-TP
D216⚠	8-759-107-91	IC UPC574J-TP
D217	8-719-911-19	DIODE 1SS119
D218	8-719-911-19	DIODE 1SS119
D219	8-719-911-19	DIODE 1SS119
D220	8-719-911-19	DIODE 1SS119

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-100-75	IC UPC1394C
IC2	8-759-729-03	IC NJM2903D
IC3	8-759-729-03	IC NJM2903D
IC4	8-759-990-82	IC TL082CP

<COIL>

REF.NO.	PART NO.	DESCRIPTION
L1	1-459-215-00	COIL (WITH CORE)

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION
PA1	*1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P
PA2	*1-508-766-00	PIN, CONNECTOR (5MM PITCH) 4P

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q101	8-729-802-71	TRANSISTOR 2SA1407-D
Q102	8-729-201-62	TRANSISTOR 2SC2555-2
Q103	8-729-202-53	TRANSISTOR 2SD1556-LB
Q104	8-729-804-48	TRANSISTOR 2SC3675
Q105	8-729-804-48	TRANSISTOR 2SC3675
Q106	8-729-804-48	TRANSISTOR 2SC3675
Q107	8-729-119-80	TRANSISTOR 2SC2688-LK
Q108	8-729-119-80	TRANSISTOR 2SC2688-LK
Q109	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q110	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q111	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q112	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q201	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R101	1-216-347-11	METAL OXIDE	0.68	5%	1W	F
R102	1-247-887-00	CARBON	220K	5%	1/4W	
R103	1-249-419-11	CARBON	1.5K	5%	1/4W	
R104	1-216-464-11	METAL OXIDE	18K	5%	2W	F
R105	1-216-359-00	METAL OXIDE	6.8	5%	1W	F
R106	1-216-350-11	METAL OXIDE	1.2	5%	1W	F
R107	1-216-372-11	METAL OXIDE	1.8	5%	2W	F
R108	1-212-998-00	FUSIBLE	470	5%	1/2W	F
R109	1-215-898-11	METAL OXIDE	10K	5%	2W	F
R110	1-202-719-00	SOLID	1M	10%	1/2W	
R111	1-202-723-00	SOLID	2.2M	10%	1/2W	
R112	1-214-937-00	CARBON	1M	5%	1/2W	
R113	1-249-417-11	CARBON	1K	5%	1/4W	
R114	1-249-429-11	CARBON	10K	5%	1/4W	
R115	1-202-719-00	SOLID	1M	10%	1/2W	
R116	1-249-423-11	CARBON	3.3K	5%	1/4W	
R117	1-249-429-11	CARBON	10K	5%	1/4W	
R118	1-249-429-11	CARBON	10K	5%	1/4W	
R119	1-214-937-00	CARBON	1M	5%	1/2W	
R120	1-215-451-00	METAL	18K	1%	1/4W	
R121	1-249-435-11	CARBON	33K	5%	1/4W	
R122	1-249-435-11	CARBON	33K	5%	1/4W	
R123	1-215-459-00	METAL	39K	1%	1/4W	
▨R124⚠		METAL			1/6W	
R125	1-215-455-00	METAL	27K	1%	1/4W	
▨R126⚠		METAL			1/6W	
R127	1-249-434-11	CARBON	27K	5%	1/4W	
R128	1-249-427-11	CARBON	6.8K	5%	1/4W	
R129	1-249-440-11	CARBON	82K	5%	1/4W	
R130	1-249-425-11	CARBON	4.7K	5%	1/4W	
R131	1-249-429-11	CARBON	10K	5%	1/4W	
R132	1-249-428-11	CARBON	8.2K	5%	1/4W	
R133	1-249-417-11	CARBON	1K	5%	1/4W	
R134	1-249-437-11	CARBON	47K	5%	1/4W	
R135	1-249-441-11	CARBON	100K	5%	1/4W	
R136	1-249-423-11	CARBON	3.3K	5%	1/4W	
R137	1-215-461-00	METAL	47K	1%	1/4W	
R138	1-215-440-00	METAL	6.2K	1%	1/4W	
R139	1-249-424-11	CARBON	3.9K	5%	1/4W	
R140	1-249-417-11	CARBON	1K	5%	1/4W	
R141	1-249-429-11	CARBON	10K	5%	1/4W	
R142	1-249-419-11	CARBON	1.5K	5%	1/4W	
R143	1-215-439-00	METAL	5.6K	1%	1/4W	
R144	1-215-439-00	METAL	5.6K	1%	1/4W	
R146	1-249-422-11	CARBON	2.7K	5%	1/4W	
R148	1-249-422-11	CARBON	2.7K	5%	1/4W	
R150	1-249-417-11	CARBON	1K	5%	1/4W	
R151	1-249-423-11	CARBON	3.3K	5%	1/4W	
R153	1-249-441-11	CARBON	100K	5%	1/4W	
R154	1-249-433-11	CARBON	22K	5%	1/4W	

• The components identified by ⋈ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

REF.NO.	PART NO.	DESCRIPTION				REMARK
R201	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R202	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R203	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R204	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R205	1-249-429-11	CARBON	10K	5%	1/4W	
R206	1-249-421-11	CARBON	2.2K	5%	1/4W	
R207	1-249-393-11	CARBON	10	5%	1/4W	
R208	1-249-429-11	CARBON	10K	5%	1/4W	
R209	1-249-441-11	CARBON	100K	5%	1/4W	
R210	1-249-429-11	CARBON	10K	5%	1/4W	
R211	1-249-429-11	CARBON	10K	5%	1/4W	
R212	1-249-433-11	CARBON	22K	5%	1/4W	
R213	1-249-415-11	CARBON	680	5%	1/4W	
R214	1-249-429-11	CARBON	10K	5%	1/4W	
R220	1-215-455-00	METAL	27K	1%	1/4W	
R221	1-215-437-00	METAL	4.7K	1%	1/4W	
⋈R222⚠.		METAL			1/6W	
R223	1-215-486-00	METAL	510K	1%	1/4W	
R224	1-215-471-00	METAL	120K	1%	1/4W	
R225	1-215-458-00	METAL	36K	1%	1/4W	
R226	1-215-449-00	METAL	15K	1%	1/4W	
⋈R227⚠.		METAL			1/6W	
⋈R228⚠.		METAL			1/6W	
R231	1-249-415-11	CARBON	680	5%	1/4W	
R232	1-249-429-11	CARBON	10K	5%	1/4W	
R237	1-215-455-00	METAL	27K	1%	1/4W	
R238	1-215-437-00	METAL	4.7K	1%	1/4W	
⋈R239⚠.		METAL			1/6W	
R240	1-215-486-00	METAL	510K	1%	1/4W	
R241	1-215-471-00	METAL	120K	1%	1/4W	
R242	1-249-422-11	CARBON	2.7K	5%	1/4W	
R243	1-249-422-11	CARBON	2.7K	5%	1/4W	
R245	1-247-887-00	CARBON	220K	5%	1/4W	
R246	1-249-422-11	CARBON	2.7K	5%	1/4W	
R247	1-249-422-11	CARBON	2.7K	5%	1/4W	
R248	1-249-399-11	CARBON	33	5%	1/4W	
R249	1-249-399-11	CARBON	33	5%	1/4W	
R250	1-249-411-11	CARBON	330	5%	1/4W	

<VARIABLE RESISTOR>

RV1	1-237-500-21	RES, ADJ, CERMET 1K	

<TRANSFORMER>

T1	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T2	1-437-079-00	TRANSFORMER, HORIZONTAL DRIVE
T3	1-439-384-11	LOT

****

MISCELLANEOUS
****

⚠.1-237-165-12	RESISTOR ASSY, HIGH-VOLTAGE	
⚠.1-426-328-11	COIL, DEGAUSSING	
⚠.1-439-382-21	TRANSFORMER ASSY, FLYBACK	
⚠.1-451-287-21	DEFLECTION YOKE (Y14FAA)	
1-452-032-00	MAGNET, DISK;10MMφ	
⚠.1-452-117-31	CRT NECK ASSY	
⚠.1-452-261-22	CRT NECK ASSY (362)	
⚠.1-453-103-32	HIGH-VOLTAGE BLOCK (HB-203(B))	
⚠.1-532-746-11	FUSE, GLASS TUBE (4A/125V)	
1-565-791-11	CONNECTOR, BNC 1P	
1-941-422-15	CONNECTOR ASSY (ROUND TYPE)12P	

REF.NO.	PART NO.	DESCRIPTION	REMARK
	1-941-995-05	CONNECTOR ASSY, MICRO 13P	(BVM-1911 ONLY)
S901⚠.	1-570-052-12	SWITCH, PUSH (AC POWER)(1 KEY)	(BVM-2011P ONLY)
V901⚠.	8-733-053-05	CRT SD-112 (M49JJP20X)	(BVM-1911 ONLY)
V901⚠.	8-733-054-05	CRT SD-112 (M49JJP21X)	(BVM-2011P ONLY)

****

ACCESSORIES & PACKING MATERIALS
****

PART NO.	DESCRIPTION	REMARK
*A-1394-088-A	Z BOARD, COMPLETE	
	(INCLUDING 1-561-337-21)	
1-561-337-21	CONNECTOR MULTI	
⚠.1-551-812-11	CORD POWER (7.0/125V)	(BVM-1911 ONLY)
⚠.1-590-151-11	CORD SET, POWER (10A/250V)	(BVM-2011P ONLY)
2-990-242-01	HOLDER (B), PLUG	
4-039-985-01	MANUAL, O&M	
4-378-901-01	KEY	
4-386-841-01	LABEL, TALLY NUMBER	
4-386-841-11	LABEL, TALLY NUMBER	
*4-039-999-01	INDIVIDUAL CARTON	(BVM-2011P ONLY)
*4-040-000-01	INDIVIDUAL CARTON	(BVM-1911 ONLY)
*4-361-988-02	BAG, PROTECTION	
*4-386-858-01	CUSHION (UPPER)	
*4-386-875-01	CUSHION (FRONT LOWER)	
*4-386-876-01	CUSHION (REAR LOWER)	